RAILROAD GAZETTE

FRIDAY, AUGUST 13.

Master Car & Locomotive Painters' Association.

The following circular has been issued by Mr. R. McKeon Secretary, from his office at Kent, O., under date of Aug. 2:

The Seventeenth Annual Convention of the Master Car & Locomotive Painters' Association will be held in Chicago, Ill., on Wednesday, Sept. 8, next, opening at 10 a. m., and will continue in session three days, or until the business is completed.

The Leland Hotel, on Michigan Avenue, fronting on the lake, has been selected as headquarters of the Association. Rates, $3.50 per day. The meeting will be held in the parlors of this house. Those wishing to engage rooms without extra charge should address the Chairman of the Committee of Arrangements, John Rattenbury, care Chicago, Rock Island & Pacific Ry., Chicago, Ill., who will give his personal attention to securing the best of accommodations for delegates and their ladies.

A general invitation is given to master car and locomotive painters throughout the states and Canada to attend the convention, and for their information we quote article IX. of the constitution, relating to membership.

"The active membership of this association shall consist of Master Car and Locomotive Painters.

"On the respective railroads, and in car and locomotive shops, throughout the United States and Canada, on roads having two or more divisions, the foreman painter of each shop shall be entitled to membership.

"This organization is intended for the mutual improvement of its members, and for our advancement in all that pertains to the successful management of the railway paint shop; we aim to labor for the best interest of the corporations by whom we are employed. Our discussions and interchange of practical views at the annual meetings, are solely for the purpose of arriving at a better knowledge of mixing and applying the colors used in the paint shop, and we labor to detect adulteration in paint stock, which is injurious to the reputation of the painter as well as ruinous to the railway companies."

The following list of subjects will be presented at the convention by the several committees appointed to report thereon. Any member of a committee unable to attend the meeting will please forward the report to the Secretary.

1. *What Remedies can we Employ to Prevent the Cracking of Painted and Varnished Surfaces?* M. W. Stines, Barney & Smith Car Works, Dayton, O.; Wm. Davis, Canada Southern, St. Thomas, Ont.

2. *Are Passenger Cars now Receiving Proper Care; what changes, if any, can be recommended to Lengthen the Durability of our Painting?* Jos. Murphy, Louisville & Nashville, Louisville, Ky.; A. J. Bishop, Cleveland, Columbus, Cincinnati & Indianapolis, Delaware, O.

3. RESOLVED, *That Flat Surfaces and Flat Colors are Preferable to Glossy Ones for Interior Decoration and Finish.* Affirmative: E. L. Fetting, New York & New England, Norwood, Mass. Negative: J. C. Stout, Kansas Pacific, Armstrong, Kan.

4. *What Improvement in the Methods and Materials now used in Painting Cars can you Recommend?* D. D. Robertson, Michigan Central, Detroit, Mich.; A. N. Bradley, Ohio & Mississippi, Cochran, Ind.

5. RESOLVED, *That when Paint on Baggage, Mail and Express Cars becomes badly Cracked, it is more Economical to burn off the Paint than to put on new Sheathing. What is the Comparative Cost?* Affirmative: C. E. Felch, Southeastern Railway, Farnham, P. Q.; Negative: F. M. Weidner, New York, Lake Erie & Western, Buffalo, N. Y.

6. *Would it not be Economy to use a Higher Grade of Paint Stock if it could be procured?* W. T. Ledford, Richmond & Danville, Richmond, Va.; John Rattenbury, Chicago, Rock Island & Pacific, Chicago, Ill.

7. *Does it make any Difference in the Finish of a Coach, whether the Nail-holes are deep or shallow, large or small, or whether the Surface is Leveled up by the wood worker, or Filled up by the painter?* Affirmative: W. E. Hibbard, Boston & Albany, Alston, Mass. Negative: D. Herbage, Flint & Pere Marquette, East Saginaw, Mich.

8. *Has the Paint Material that you have used in the past year compared favorably with material used in previous years?* H. W. Walton, Providence & Worcester, Valley Falls, R. I.; Wm. Sharp, Lake Shore & Michigan Southern, Adrian, Mich.

In addition to the introduction and discussion of the above subjects, there will be a large exhibit of color tests on panels, prepared by members of the Association in October last, and exposed to the weather; the object being to determine the proper proportions of oil, japan and turpentine, which should be used in mixing colors to produce the best results as to durability, etc.

There will also be a number of panels finished on the natural woods by different methods, so as to ascertain which is the best adapted to the outside finish of cars where it is desirable to retain the natural color and grain of the wood.

A copy of the constitution of the association will be furnished to foremen car and locomotive painters on application to the Secretary.

Master Mechanics' Association.

Mr. J. H. Setchel, Secretary of this Association, issues the following list of committees and subjects for discussion at the Twentieth Annual Convention, to be held in June, 1887:

1. Proportion of Locomotive Cylinders; to give the best results, what rule should be followed for proportioning the cylinders of an engine, when the size of driving wheels, weight available for adhesion, and boiler steam pressure are given quantities. Committee, Charles Blackwell, Union Pacific; F. L. Wanklyn, Grand Trunk; T. E. Barnett, Canadian Pacific.

3. Traction Increasers; their various types and relative merits; also cases in which their use can be recommended. Committee, R. H. Briggs, Chesapeake, Ohio & Southwestern; D. O. Shaver, Pennsylvania Railroad; T. J. Hatswell, Flint & Pere Marquette.

3. Crossheads and Guide Bars; the various types in use, the materials and their construction, and results obtained. Committee, F. M. Dean; N. W. Howison; J. B. Henny, New York & New England.

4. Steam Packing; the various forms of piston packing in use and obtained results. Also the most economical and satisfactory packing for piston rods, valve stems, regulator and air pump stuffing boxes, with results obtained. Committee, J. W. Stokes, Ohio & Mississippi; Allen Cook, Chicago & Eastern Illinois; Henry Schlacks, Illinois Central.

5. Locomotive Preparation; washing out and lighting up locomotives, showing the best system in use for washing out, and most economical and expeditious mode of raising steam in firing up and the necessary plant for same. Committee, G. W. Ettenger, Chesapeake & Ohio; W. H. Thomas, East Tennessee, Virginia & Georgia; T. W. Gentry, Richmond & Danville.

6. Coaling up Locomotives; the various plans in use, and their relative cost and efficiency. Committee, J. Davis Barnett, Midland of Canada; James Strode, Northern Central; Charles Graham, Delaware, Lackawanna & Western.

7. Standard Form of Tire Section. Committee, J. N. Lauder, Old Colony; Jacob Johann, Chicago & Atlantic; H. N. Sprague, Pittsburgh.

8. What Control has the Engineer over the Wear of Driving wheel Tires? Committee, John McKenzie, New York, Chicago & St. Louis; J. S. Graham, Lake Shore & Michigan Southern; Fred. B. Griffith, Delaware, Lackawanna & Western.

The associate members appointed to read papers are F. B. Miles and Robert Grimshaw.

The committees appointed to prepare obituaries or memorials of deceased members are as follows:

On M. M. PENDLETON, Messrs. C. W. Walker, J. F. Devine and James McGlenn. On G. E. BOYDEN, Messrs. J. N. Lauder, George Richards and Joseph M. Whitlock. On S. H. DOTTERER, Messrs. R. C. Blackall, H. W. Eddy and O. Stewart. On J. C. MCCUNE, Messrs. J. S. Turner, H. P. Olcott and A. H. Watts. On JOHN IVANSON, Messrs. James Patterson, E. A. Campbell and James Meehan, C., N. O. & T. P. R. R.

Other committees are announced as follows:

General Supervisory Committee, Printing and Boston Fund: William Woodcock, Jacob Johann, R. H. Briggs, Geo. Richards and J. H. Setchel.

Standing Committee on Subjects: T. B. Twombly, Chicago, Rock Island & Pacific; Charles Blackwell, Union Pacific; George Hackney, Atchison, Topeka & Santa Fe.

Committee of Arrangements for Twentieth Annual Meeting: George W. Cushing, Northern Pacific, St. Paul, Minn.; Clem. Hackney, Union Pacific, Omaha, Neb.; R. W. Bushnell, Burlington, Cedar Rapids & Northern, Cedar Rapids, Iowa.

Bridges Authorized at the Late Session of Congress.

At the late session of Congress acts were passed authorizing the construction of bridges as follows:

Across the Mississippi, at or near Dubuque, for railroads, wagons and foot passengers. It is to be built by the Chicago, Burlington & Northern Railroad Co.; may be built with or without a draw, conditions to protect river traffic being imposed in either case.

By the city of Detroit, to connect Belle Isle with the mainland.

By the Covington & Cincinnati Elevated Railroad & Bridge Co., across the Ohio.

By a bridge company, across the Red River, between Texas and the Indian Territory, near Dennison.

Substituting the Chicago, Burlington & Northern for the Winona, Alma & Northern Railroad Co., in the act authorizing the bridging of the Wisconsin, Chippewa and St. Croix Rivers.

By the New York & Baltimore Railroad Co., for the Baltimore & Ohio, across the Kill von Kull, or Staten Island Sound.

By the St. Joseph & Rio Grande Railroad Co., across the Missouri, near St. Joseph.

By the Central Missouri Railroad Co., across the Mississippi, at or near Alton. The company may make it a wagon and passenger toll bridge if it chooses.

By the Chicago, Freeport & St. Paul Railroad Co., across the St. Croix, from Prescott, Wis., to Stillwater, Minn.

By the New York & Council Bluffs Railroad Co., across the Mississippi, near Keithsburg, Ill.

By the New York & Council Bluffs Railroad Co., across the Illinois, near Lacon, and over the Des Moines, in Iowa, anywhere.

By the Winona Pontoon Bridge Co., a pile pontoon railway and wagon bridge across the Mississippi at Winona.

By the Wabash Railroad Co., across the Missouri, near Kansas City.

By the Nashville, Jackson & Memphis Railroad Co., across the Tennessee.

By the New York & Council Bluffs Railroad Co., across the Missouri, near Council Bluffs.

By the Inter-State Rapid Transit Co., across the Kansas River, in Wyandotte County, Kan.

By the Chicago, Milwaukee & St. Paul Railroad Co., across the Missouri, in the counties of Clay, Platte, or Jackson, Mo.

A pile and pontoon railway and wagon bridge across the Mississippi at Red Wing.

By the St. Louis & Kansas City Short Line Railroad Co., across the Missouri, near St. Charles, Mo.

By the St. Louis & Kansas City Short Line Railroad Co., across the Missouri, near Saline City.

Across the Red River, in Texas.

By a bridge company, across the Missouri, near Atchison.

By the Dakota Central Railroad Co., across the Missouri, near Pierre, Dak.

By the Chicago, Milwaukee & St. Paul Railroad Co., across the Missouri, near Chamberlain, Dak.

Across the Menominee River, Wisconsin, and sundry bridges over Young's Bay and Williamette River, Washington Territory and Oregon.

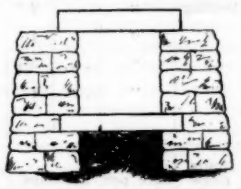
Contributions.

Culverts.

PHILADELPHIA, Aug. 7, 1886.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In answer to W. O. Lelimé in your issue of Aug. 6, a box culvert, constructed as per fig. 1, is very bad practice, because the walls are undermined as soon as the paving commences



to wash out. A culvert built as shown by fig. 2 will not wash out unless the paving and material between the walls is cut out below the foundation.

I would suggest that all box culverts should be built as shown by the inclosed sketch. M. F. B.

Hydraulic Drop Tables.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Could any of your readers inform me of any railroads that are using hydraulic drop tables, and greatly oblige a

SUPERINTENDENT OF MACHINERY.

Piece Work.

V.

METHOD OF INTRODUCING AND FORMING A SCHEDULE OF PRICES.—CONTINUED.

It has already been said that it is very important that the prices fixed upon be correct. To insure this result let the work of obtaining them be proceeded with cautiously, taking a few parts at a time, in order that the foreman may be able to give each job the necessary supervision, and that the workman may know that the time he spends on his job is carefully noted. After the preparation of the list, the foreman will be able to fix and enter in it many prices without trial, from the knowledge he already possesses of the time required to do the work. To procure others for which he lacks the required information, the adoption of the system of "Service Cards" already referred to and further illustrated will best serve his purpose, if he is careful to enter upon these each job he gives to a workman, the nature of the operation and the time consumed in performing it.

The following "Service Cards" contain the record of the time required to finish six rocker arms and two links, and illustrate the method of recording the operations in each shop:

SERVICE CARD.

M. P. NO. SMITH SHOP.

Date....., 1885.

Description of parts.	Operation.	Charge	Hours work day	Hours piece work	Price per unit.	Earnings	Remarks
					p. ton $	$	
6 Rocker arms.	Shaping.	S. O. 727	.....	8½	16.00	8.64	
6 " "	Bending.	S. O. 727	.....	6	12.00	6.48	

Names of workmen.	Hours piece work.	Rate per hour.	Earnings.	
Jas. Muhall	14½	.....	$4.21	
P. Dedgen	14½	.....	3.57	
J. Roost	14½	.....	2.14	
O. Barry	14½	.....	2.14	Correct.
H. Fanning	14½	.....	1.64	
W. H. Myers	14½	.....	1.42	G. L. JUDY.
				Foreman.

SERVICE CARD.

M. P. NO. SMITH SHOP.

Date....., 1886.

Description of parts.	Operation.	Charge	Hours work day	Hours piece work	Price per unit.	Earnings	Remarks
					$	$	
6 Rocker arms.	Forging.	S. O. 727	.....	38	5.00	30.00	

Names of workmen.	Hours piece work.	Rate per hour.	Earnings.	
			$	
G. A. Zink	38	.....	14.59	Correct.
A. Rauger	38	.....	7.84	
J. Rapp	38	.....	7.57	G. L. JUDY,
				Foreman.

SERVICE CARD.

M. P. NO. MACHINE CARD.

Date....., 1886.

Description of parts.	Operation.	Charge	Hours work day	Hours piece work	Price per unit.	Earnings	Remarks
						$	
6 Rocker arms, Class "B"	Inspecting laying off	S O. 727	4	.....	.....	1.10	

Names of workmen.	Hours piece work	Rate per hour.	Earnings.	
W. Wolford	None.	27½	$1.10	Correct.
				B. FITZPATRICK,
				Foreman.

SERVICE CARD.

M. P. NO. MACHINE SHOP. Date..... ..., 188..

Description of parts.	Operation...	Charge.....	Hours day work.....	Hours piece work.....	Price per unit.	Earnings....	Remarks....
6 Rocker-arms, class P. A.....	Boring.	S. O. 727.	.....	23	$1.08	$6.48	
6 Rocker-arms..	Turning..	S. O. 727.	.....	45	2.25	13.50	

Names of workmen.	Hours piece work.	Rate per hour.	Earnings.	
				Correct.
A. Hamilton....	68	.....	$19.98	B. FITZPATRICK, Foreman.

SERVICE CARD.

M. P. NO. MACHINE SHOP. Date..... ....., 188..

Description of parts.	Operation...	Charge.....	Hours day work.....	Hours piece work.....	Price per unit.	Earnings....	Remarks....
6 Rocker-arms, class P. A	Shaping..	S. O. 727.	.....	9	$0.48	$2.88	
6 Rocker-arms	Slotting..	S. O. 727.	.....	12	.50	3.00	

Names of workmen.	Hours piece work.	Rate per hour.	Earnings.	
				Correct.
F. Warner.. ...	21	.....	$6.48	B. FITZPATRICK, Foreman.

SERVICE CARD.

M. P. NO. MACHINE SHOP. Date..... ....., 188..

Description of parts.	Operation...	Charge.....	Hours day work.....	Hours piece work.....	Price per unit.	Earnings....	Remarks...
6 Rocker-arms, class P. A.....	Finishing vise-work...	S. O. 727.	.....	42	$2.00	$ 12.00	

Names of workmen.	Hours piece work.	Rate per hour.	Earnings.	
				Correct.
Geo. Small.....	42	.....	$12.00	B. FITZPATRICK, Foreman.

SERVICE CARD.

M. P. NO. SMITH SHOP. Date... ...., 1886.

Description of parts.	Operation...	Charges.....	Hours day work.....	Hours piece work.....	Price per unit, per ton.....	Earnings.....	Remarks.....
2 links..... ..	Blocked out ...	.....	.....	2	$ 16.00	$ 2.40	
2 " dies... ..	Blocked out	.....	.....		16.00	.40	
						2.80	

Names of workmen.	Hours piece work.	Rate per hour.	Earnings.	
J. Tryshall.	2	29½	$0.77	
J. Rost	2	20	.53	
H. Hartman ...	2	15	.39	
C. Rodenbeck..	2	15	.39	Correct.
W. Dryer..... ..	2	13½	.36	G. L. JUDY,
H. Ranning.. .	2	13	.36	Foreman.
			$2.80	

SERVICE CARD.

M. P. NO. MACHINE SHOP. Date..... ....., 1886.

Description of parts.	Operation..	Charge.....	Hours day work.....	Hours piece work	Price per unit.....	Earnings ..	Remarks....
One pair links..	Testing and laying out.	2 Class I.	.....	.....	.....	$ ...	
One pair hangers....			.....	.....	.....	.....	
One pair dies ..			.....	.....	.....	.....	
One pair link saddles.			3	.....	.....	0.82½	

Names of workmen.	Hours piece work.	Rate per hour.	Earnings.	
				Correct.
W. Wolford.....	.....	27½	$0.82½	B. FITZPATRICK, Foreman.

SERVICE CARD.

M. P. NO. SMITH SHOP. Date..... ....., 1886.

Description of parts.	Operation...	Charge.....	Hours day work.....	Hours piece work.....	Price per unit. ton..... per	Earnings.....	Remarks.....
2 lifting links...	Blocking out ...	.....	.....	.....	$ 18.00	$ .30	
2 " " ..	Finishing	.....	.....	.....	.35	.70	
2 link saddles ..	Blocked out....	.....	.....	p. ton	18.00	.46	
2 " " ..	Finishing	.....	.....	.....	.50	1.00	
2 links.... ..	"	....	.....	.....	1.25	2.50	
2 " dies.....	"	.....	.....	.....	.05	.10	
2 " " plates	"	... .	.....	.....	.04	.08	
				12		5.14	

Names of workmen.	Hours piece work.	Rate per hour.	Earnings.	
T. Leman.....	12	25	$3.43	Correct.
P. Weber.....	12	12½	1.71	G. L. JUDY,
			$5.14	Foreman.

SERVICE CARD.

M. P. NO. MACHINE SHOP. Date..... ....., 1886.

Description of parts.	Operation...	Charge.....	Hours day work.....	Hours piece work.....	Price per unit	Earnings	Remarks....
One pair links..	Planing.	5 Class F.	... ..	9	$1.31	$2.62	
" " hangers.....	"	"	.....	2	.32	.64	
One pair link dies.....	"	"	.....	9	1.35	2.70	
One pair link die plates....	"	"	.....	1	.32	.32	
One pair link saddles.....	"	"	.....	1½	.23	.46	

Names of workmen.	Hours piece work.	Rate per hour.	Earnings.	
				Correct.
H. Miller.....	22½	.....	$6.74	B. FITZPATRICK Foreman.

SERVICE CARD.

M. P. NO. MACHINE SHOP. Date.. ....., 1886.

Description of parts.	Operation...	Charge ...	Hours day work.....	Hours piece work	Price per unit	Earnings	Remarks....
One pair links..	Slotting.	5 Class I	.....	14	$2.35	$3.70	

Names of workmen.	Hours piece work.	Rate per hour.	Earnings.	
				Correct.
F. Scherd.....	14	.....	$4.70	B. FITZPATRICK, Foreman.

SERVICE CARD.

M. P. NO. MACHINE SHOP. Date..... ... ., 1886.

Description of parts.	Operation...	Charge	Hours day work.....	Hours piece work	Price per unit	Earnings	Remarks....
One pair links	Drilling and reaming	5 Class I.	... ..	4½	$0.53	$1.06	
One pair link dies.....	Drilling	"	.....	2	.17	.34	
One pair link saddles	"	"	.....	1	.12	.12	
One pair link hangers.....	"	"	.....	3½	.35	.70	
One pair link die plates.....	"	"	.....	1	8½	.07	

Names of workmen.	Hours piece work.	Rate per hour.	Earnings.	
				Correct.
J. Finlayson....	12	....	$2.29	B. FITZPATRICK, Foreman.

SERVICE CARD.

M. P. NO. MACHINE SHOP. Date ....., 1886.

Description of parts.	Operation...	Charge	Hours day work	Hours piece work.....	Price per unit	Earnings	Remarks....
One pair link dies...	Turning.	5 Class I.		3	$ .42	$ .84	
One pair hangers.....	"	"	.....	3	.50	1.00	
One pair saddles...	"	"	.....	4	.56	1.12	
One pair die pins.....	"	"	.....	3	.42	.84	

Names of Workmen.	Hours piece work.	Rate per hour.	Earnings.	
				Correct.
J. R. Bitner....	13	....	$ 3.80	B. FITZPATRICK, Foreman.

SERVICE CARD.

M. P. NO. MACHINE SHOP. Date....., 1886.

Description of parts.	Operation...	Charge	Hours day work.....	Hours piece work	Price per unit	Earnings	Remarks....
One pair links..	Fitti'g up	5 Class I.	.....	53	$ 9.00	$ 18.00	This includes finishing eccentric rod jaws.

Names of workmen.	Hours piece work.	Rate per hour.	Earnings.	
				Correct.
G. Needhammer	53	$18.00	....	B. FITZPATRICK, Foreman.

There is still another trouble which the foreman must guard against, and that is the disposition on the part of some workmen to nurse a job as long as they can safely do so, in order to obtain excessive prices. This, however, though it may occur, will be corrected in the near future. Once a foreman becomes interested in the work of obtaining prices, he will watch results very closely and give his men few opportunities to impose on him. We predict also, that as he extends the system of piece work, he will soon notice a change for the better in the output of his shop, which will stimulate him to greater efforts to reach the end of his task. We confidently predict, also, that he will accomplish his object without a realization of much of the trouble and discouragement which he had pictured to himself at the start.

F. D. CASANAVE.

TULARE CITY, Cal., July 27, 1886.

TO THE EDITOR OF THE RAILROAD GAZETTE :

I believe piece work to be the best way of doing work, as it would abolish "botchers" and "pensioners" and diminish strikes. The principle of paying men for what they actually do is doubtless sound.

I would like to ask Mr. Casanave how in putting a price on work finished in the machine shop he provides for bad forgings from the blacksmith shop?

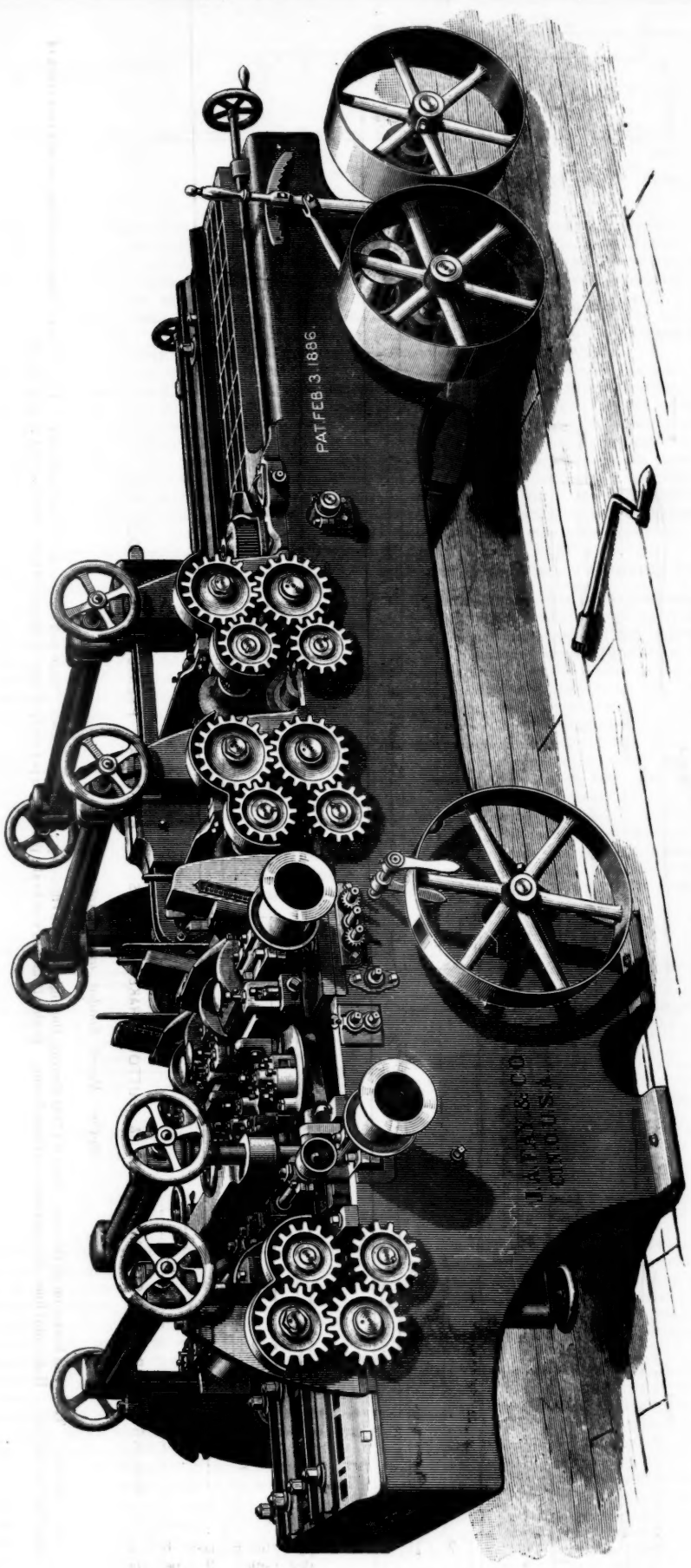
Let us take follower bolts for piston work : A bolt to be finished to ⅛ in. can be made just as good if it is forged of ⅛ in. round iron; turning off from ⅛ to ¼ of an inch, which I have often done, does not add to the quality of the work. The cost of finishing is often increased from 50 to 300 or 400 per cent. by bad forgings.

W. DE SANNO,
Engineer and Machinist.

Doane's Patent Duplex Flooring Machine.

Many wonderful achievements in the various branches of science and mechanics are continually being made for reducing labor, improving methods, increasing capacity, and attaining greater results. But perhaps in no department has greater progress been made than in that of wood cutting machinery. Those conversant with the state of the art 50 years ago, who contrast it with that of to day, cannot fail to note the remarkable developments that have taken place. Then the logs were converted into lumber by hand, or the slow old reciprocating saw mill. The surfacing as well as the matching of lumber was done by hand. The window sash, doors and the mouldings for our dwellings as well as the furniture with which they were furnished, was also all made by hand. A mechanic who could work 400 feet of flooring per day was regarded a prodigy. Now, how different. Instead of this, inventive genius has given us machines capable of performing more than 300 times as much work in the same time, and equal to the labor of more than 200 men. And this may be said of most every department in which wood tools are used.

A recent invention, which appears to deserve the attention of lumbermen and is likely to grow in popularity, is a duplex planing machine for finishing two pieces of lumber at once. Messrs. J. A. Fay of Cincinnati are the first, we be



DOANE'S PATENT DUPLEX FLOORING MACHINE.
Made by J. A. Fay & Co., Cincinnati.

lieve, to bring out and introduce machines to perform the result described. As a matter of interest to many, we place before our readers a fine engraving and description of this remarkable machine. It will plane on both sides, and tongue and groove all four edges, and work a bead upon the top surface of two separate flooring boards at one operation, with a capacity of 40,000 to 60,000 ft. per day, according to the speed of feed at which it is run. It is the result of a long-continued series of experiments, the design and aim being to generate a machine capable of performing a much larger amount of work per day, and at a greatly reduced cost of production than any existing machine. It is claimed to be the most rapid and powerful planing and matching machine that has ever been designed, and where large quantities of flooring is daily required to be made it will perform the task with wonderful economy of time and labor, while the quality of work is of the highest standard.

The introduction of the Fay & Co.'s lightning flooring machine a few years ago, with its largely increased capacity for work, attracted the attention of machine builders to the importance of greater rapidity of operation, in order to compete with it, and the result has been that the speed of the feed of planers has been much increased, while the work produced has been, in most cases, correspondingly inferior when working to their full capacity, and the necessity has arisen for machines which would produce a still greater quantity of work of superior quality, with a corresponding reduction in labor. The accompanying engraving is a correct representation of such a machine, which is thought to be the most perfect of this kind yet introduced. It is the embodiment of much care and thought and is covered by several letters patent, which fully protect it. It is said with this machine one man can feed 40,000 ft. of lumber easier than 20,000 ft. through an ordinary planer. It is remarkably simple, and the arrangement and combination of its parts are such that it is at all times under perfect control of the operator, and are of a character to not only greatly enlarge its capacity, but nhance its efficiency. It is constructed upon a massive and heavy frame, with broad sole plates, affording large floor area, duplex feeding in rolls, duplex upper cutting cylinders, duplex matching works, for operating upon the edges of two boards at one operation, duplex pressure bars for the under cylinder, and duplex beading attachments, one for each board. The feed rolls are of large diameter, two set in front of the upper, and one set after the lower cylinder. These take the lumber entirely out of the machine, and retain each board always in a straight line. The feed rolls are gibbed to planed upright stands, and driven by a train of heavy patent expansion gearing of Fay & Co.'s invention. The cylinders are made from solid wrought steel, slotted on all four sides, with chip breaking lips for cross grained lumber. The duplex upper cylinders, also the lower cylinders, run in specially long and heavy bearings, with large pulleys for wide belts, and driven direct from the counter shaft. The upper cylinder frames and bearings are planed to fit upright stands, which are cast to a solid bed extending across the machine, which not only ties them together in the most rigid manner, but always retains them in line. The upper cylinders raise and lower, both simultaneously or independently, and have adjustable pressure bars before and after the knives. Those before the cut can be set in close proximity to the cylinder, and still follow its periphery without liability or danger of contact with it.

The matching works are adjustable to suit the width of the board from the working side of the machine. The pressure bars over the under cylinder are duplex, and have both a simultaneous and independent vertical adjustment, or by removing a pantle, can be thrown out of the way for access to the cutters. The lumber platen has the duplex board guide, also patent duplex automatic edge feed, for carrying the board to the first feeding rolls. This is an advantage over the old method, as the lumber is moved in a straight line to the feed rolls, and through the cutting tools, even if warped and crooked. In ordinary fast-feed planers, the cutting cylinders run at a very high speed, with a feed of ⅛ in. to ¼ in. at each revolution of the cylinder, which necessarily causes inferior work. With this machine it is just the opposite. While the cylinders are run at the usual speed, the feed is slow, permiting the easy feeding of two boards by one attendant, and yet on account of its duplexity it is capable of an enormous amount of work. The capacity of this machine is to plane two sides up to 6 in. thick, and match up to 8 in. wide on two pieces of flooring of unequal thickness simultaneously.

Messrs. J. A. Fay endeavor to use only the best material and labor in the construction of this machine. All the revolving parts are balanced with care, and all surfaces are planed to fit. Every machine is subjected to a thorough and practical test, to insure perfect completeness in all its parts, and is guaranteed to perform as stated. It weighs, boxed, about 13,000 lbs. For further particulars, address the patentees and manufacturers, Messrs. J. A. Fay & Co., Cincinnati, Ohio.

Foreign Technical Notes.

A signal torpedo is being introduced on the Austrian railroads which presents some curious advantages. Instead of being placed in position, it is shot backward by a spring, being attached to a sort of carriage which enables it to slide along the rail but does not allow it to fall off. By regulating the action of the spring the torpedo can be sent any required distance up to three hundred yards. All that the rear brakeman has to do is to place the torpedo slide on the rail and give the spring the necessary impulse for putting it exactly where he wants it to stop. It is so arranged that he does not even have to leave the car in order to do it; the signals can thus be given while the train is still in motion. The whole apparatus weighs about half a pound; it rises less than a quarter of an inch above the level of the rail. Of course a special form of torpedo is required for each particular style of rail.

The inventor has also made arrangements by which a whistle may be attached to these torpedoes, in order that the watchmen, etc., along the line may be informed of the sending of these signals. It is operated by a rubber bag full of compressed air which is fastened to the torpedo, and moves with it.

Burlington Brake Tests—Brake Beam Pressure Diagrams, Widdifield & Button Brakes.

We begin the series of diagrams, which we shall publish, giving the results of the Burlington brake tests with those showing the variations in the brake-beam pressure of the Widdifield & Button brake in two runs of four stops each. For greater clearness we have combined the two diagrams for each of the four stops together, giving them the same base or zero line and the same starting point on that line for the beginning of the stop, marked by a small circle.

The moral to be drawn from these digrams, as well as from the others to be presented hereafter, cannot be fully appreciated without comparing them together. Pending their appearance we may say, however, that the brake-rod tension on the air and vacuum brakes is applied very gradually indeed even in emergency stops, requiring a distance of 300 to 600 ft. after the brakes begin to go on before they are fully applied. With all the buffer brakes so far tested the application of the tension and pressure is quite sudden, even more so in the direct-acting buffer brakes than in the Widdifield & Button shown herewith, which applies the brakes by the buffer pressing a friction wheel against a combined wood and paper spool on the axle. It is therefore necessary for the axle to make from two to five revolutions before the brakes are fully applied, all of which is accurately indicated

on the diagram. With the direct buffer the line is often practically vertical.

The two series of diagrams shown were each for 25-car mixed trains, half the cars (12) being loaded and half (13) empty, and three-quarters of the load being in the rear half of the train. The great contrast both in the power and the action of the brakes is due to the simple fact that in the first test, showing the lowest brake tension and the greatest irregularity, the buffer brake was acting on all the cars, while on the second run, showing the best action in all respects, the rear 13 cars had no brakes on, so that they pressed down with their full force on the autographic recording car, which was in the middle of the train.

The details of the runs are shown in the following comparative figures, the specified stops for each run having been :

Stop 1—20 miles per hour on a level.
" 2—40 " " " "
" 3—20 " " one per cent. down grade.
" 4—40 " " " " "

	Run 1. Stops 341-344. 25-car mixed train. 11 loaded, 14 empty. All cars braked.	Run 2. Stops 811-814 25-car mixed train. Brakes on front 12 only.
Stop 1—Speed	22.0	22 3
Distance	593	578
Time	32½	28
Stop 2—Speed	40.5	39.3
Distance	1,889	1.858
Time	64½	56¾
Stop 3—Speed	21.0	21.4
Distance	536	800
Time	26	39½
Stop 4—Speed	41.3	42.8
Distance	3,025	3.565
Time	94½	94½

(Official corrected distances and speeds.) Eames engine-brake, straight vacuum emergency stops. System of numbering stops, used on all records : The hundreds indicate the day of the tests, running from 1 to 20 ; the tens indicate the number of the run on each day ; the unit the number of the stop. Stop 341 indicates stop No. 1 on the fourth run of the third day of the tests, etc.

The beginning of each stop is marked by a small circle, directly above which is given the initial speed in miles per hour. The speed written nearest the base line is for the lower diagram (Run 1—Stops 341-344), and the one above it for the higher diagram (Run 2—Stops 811-814), or those in which the brakes on the rear car were cut out so as to permit them to press more forcibly on the middle car, which was the rear braked car, and consequently had its efficiency greatly increased.

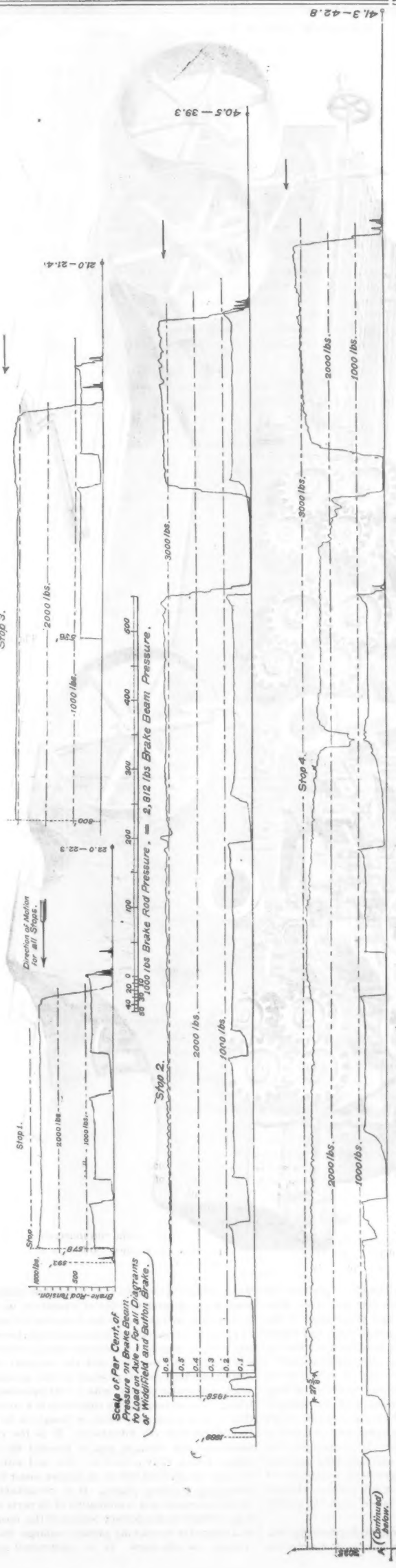
The comparative pressure on the brake-beam is in an important sense a false standard by which to compare the performance of different brakes, on cars of different weights, because the weights per axle, and hence the admissible brake-pressure, are different. We have, therefore, added a scale at the left of stop No. 2, showing the efficiency of the brakes in per cent. of the total weight on the braked wheels, which is really the fairer way of presenting it, since it may be assumed—at least it ought to be assumable—that each company has prepared, so far as the nature of the apparatus permits, to graduate its brake pressure according to the weight of its cars, so as to make it as high as is safe ; the usual limit being that the brake pressure shall be from 90 to 100 per cent. of the load on the wheels.

That this was not fully considered is evident from the fact that no attempt was made by three out of the five competitors even to equalize the pressure on the brake-beams by the cheap addition of a dead-lever, so as to gain the full advantage on all the wheels of the pressure on the most forcibly braked wheels. This neglect reduced the pressure on the least loaded wheels to from 70 to 80 per cent. of the pressure on the most loaded, as was shown in connection with the drawings of the foundation brakes which appeared in the *Railroad Gazette* of July 30 last. When so important a detail as this was neglected, it is not likely that any very nice adjustments to the weight of the car were attempted by most of the competitors. It would, therefore, be wrong to lay too much stress on the per cent. of the brake pressure to the load on the wheels. The absolute pressure on the brake-beam might well be the fairer standard, if there were to be but one ; but it is obvious that both are important, since it is not likely that so great a difference of weight as that between the "American" cars (27,600 lbs.) and the Eames and Widdifield & Button cars (21,000 lbs.) was not taken some account of in the brake-gear.

Therefore, we have added both. We shall give the same details with similar diagrams of the other brakes tested, and it will go far to explain their apparent anomalies.

For taking the diagrams the brakes one truck are disconnected, and the brake-rod which is attached to the first or live brake-lever, which carries the first brake-beam, is attached instead to the spring of the recording apparatus. The diagrams as taken, therefore, give primarily the tension on the brake-rod, but as that is a fact absolutely without meaning, if the brake leverage is not taken into account, we neglect it altogether, except to add a special scale at the side of the diagram of stop No. 1. The primary scale for the brake-rod tension was 450 lbs. per vertical inch. This vertical scale will be the same for all the diagrams except that, from lack of sufficient motion with the American brake, the vertical scale was finally reduced one-half, as will be seen in later diagrams.

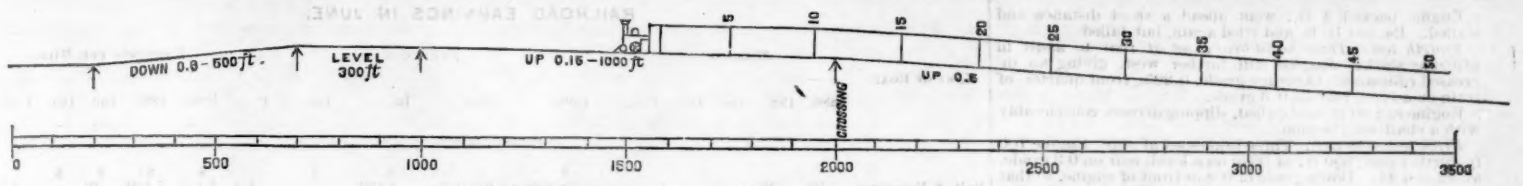
As might be expected (or at least as is easily explained) from the nature of the brake, when the brakes are on the rear cars they drag back on those in front so as to reduce the compression on the draw-bars toward the front of the train and thus diminish the pressure. Not only is this so, but when the



BURLINGTON BRAKE TESTS, WIDDIFIELD & BUTTON BRAKE—DIAGRAMS OF BRAKE-BEAM PRESSURE ON MIDDLE CAR.

25-Car Mixed Loaded and Empty Trains.

Run 1 (That showing the lowest brake pressure ; about 700 lbs.). Train had brakes on all the cars. Run 2 (That showing the highest brake efficiency ; about 3,000 lbs.). Train had brakes on 12 front cars only. Rear 12 cars behind recording car and rear truck of recording car cut out. Horizontal lines show pressure on brake-beam. Scale of efficiency of brake pressure in per cent. of load on braked wheels shown at end of stop No. 3.



PROFILE OF TRACK AT WEST BURLINGTON YARD.

brakes toward the rear chance to be set pretty hard, so that they drag back upon the front, they take off the compression of the draw-bars in front altogether, so as entirely to release the brakes in front. This permits the front cars to lurch forward with more or less violence, thus releasing all or many of the brakes behind them, and setting their own brakes again violently. That gives a sudden impact to the cars ahead, which probably causes a jerk which takes their brakes off, but in any case, the rear of the train, having now no brakes on, runs forward, sets its own brakes, drags back, releases those in front; they drag off the rear brake again, and so the endless cycle goes on in a kind of wave-like action through the train, which produces violent shocks even at the front where the action is smoothest, as will appear from further diagrams showing the dynamometer records at the head of the train, and making it quite impossible to stand up or retain a seat in the rear car, however carefully braced.

As a brake to be applied to all the cars of a train even of twenty-five cars, therefore, the brake is an unquestioned failure. The shocks are most violent as the speed is slower, and increase toward the end of the stop. The lower diagrams faithfully represent this action. In stop 1 the brakes went on and off four times in the middle car (and oftener almost always at the rear). In stop 2 they went on and off seven times. In stop 3 only once, and in stop 4 ten times. Every one of the applications and releases is accompanied by very violent action of the brake-gear, which no mechanism could be expected to stand very long. This is stated from actual observation through a hole in the floor of a car toward the rear, where the winding and unwinding of the brake-chain took place so rapidly and so violently that it seemed impossible that it could hold together during a stop. When worn by service, as in the nature of things it soon would be, it would be quite certain that in many cases it would not stand the strain, and a loose brake-rod and chain is a nasty thing to have flying around under a car. The inventor still has hopes that he can remedy these difficulties, and we would not prejudice his case unnecessarily, but the occasion seems to be an appropriate one to state facts just as they are.

With 12 unbraked rear cars, 9 of them loaded, and its own weight besides pressing down upon the front buffer of the autographic recording car, we have the very much better action shown in the larger diagrams. In stops 1 and 3, at 20 (actually 22) miles per hour, the brakes once on remained on and the action of the brakes could hardly have been better after they were once applied, although the objectionable suddenness of application is still there. It is difficult to see how, with so much weight pressing down upon the recording draw-bar, the brakes could have released at all, but it will be seen that they did and remained off for some distance, probably from some lurch of the front of the train, since there was nothing to cause irregular motion at the rear.

In stop 4, on a 54 ft. per mile down grade, there was one complete and one partial release, but otherwise a very good diagram. The shocks were very tolerably gentle in all these stops with the rear cars cut out, there being only one bump of much force—that when the brakes were first applied.

This was, on the face of it, no worse than with the Eames or the Westinghouse emergency stops, but here comes in the worst feature of the buffer brakes, one which was illustrated in rather terrific fashion by the attempted "service run" of the American brake down a 54 ft. grade, a few days later. If these shocks came only in emergencies, so that they could be avoided by taking care and time, they might be borne, but the more gently it is attempted to make the stops the more there are of these shocks; each one less violent, but always—so far as was developed at the Burlington brake tests—too violent for stock or light freight, and often too violent for car wheels and the sides of box cars. It is impossible to "handle" a buffer-brake train. "Handling" means slight changes in low velocities. That means putting on the brakes somewhere in parts of the train, and that means increased irregularity of motion, increased brakes-on-brakes-off action, and usually violent shocks. Making test stops at some considerable speed, therefore, is placing the brakes under the best condition to put their best foot forward. Take away the steady pressure of the rear cars due to their high velocity in the stops which show best above, and let them be feeling their way down to a yard, and we shall have from the train, with only half the cars equipped with buffer brakes, action very similar to that shown on the diagram of a fully equipped train making quick stops. This may be asserted with great positiveness, because this precise action was observed again and again in the course of the tests.

The slight irregularities in the diagrams just before the brakes apply indicate when the shock which compressed the draw-bars was received, which caused a vibration of the apparatus, and do not indicate an actual application of the brakes. The horizontal space indicates the distance the train moved before the effect of the impact applied the brakes. From the time of applying the brakes on the engine (given by an electric bell in each observing car), there was often a very considerable time before the brakes went on, as notably in the lowest stop in the engraving.

Burlington Brake Tests—The Service Run Down Hill.

As one of the details of the Burlington brake tests requiring the least work to present it properly, we give above a diagram of the speed maintained in the required service drop down hill at a uniform speed. Three trials were to be made by each competitor, but the American made only one, the disastrous one described last week.* The other two buffer brakes did not reach the test at all.

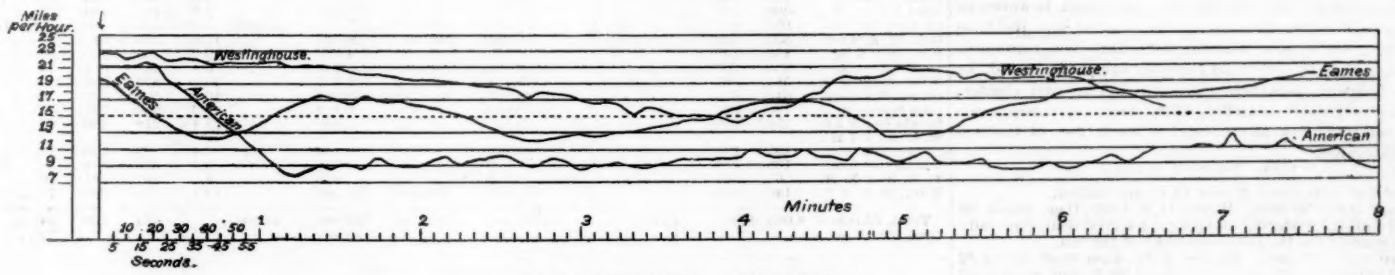
In the case of the Westinghouse and the Eames brakes the test developed nothing new nor specially important. Three trials were made by each, the first attempt of each being poor and the last the best. The diagram shows the third run of each brake. It was made clear by the test that, on the one hand, it was not so easy to handle the brakes skillfully in this way as to make stops with them, while on the other hand there is no great difficulty in doing so in practice. As there is nothing to prevent using two or three hand brakes instead on easy grades, if desired, the case is additionally clear. For very long and heavy grades the Westinghouse use their pressure-retaining valve, largely used in Colorado, which retains 10 lbs. pressure or more, as desired, in the brake cylinders permanently, regardless of what the engineman does with the remaining pressure, thus doing away with all necessity for using "straight air" instead of the automatic.

The conditions of this test were that the train of 50 loaded cars (afterward made mixed cars), should have a speed of 20 miles per hour 500 ft. back of the top of the hill, which was to be reduced to 15 miles per hour as soon as possible, and the latter speed maintained during a run of about two miles down a grade of 55 ft. per mile, or a little over 1 per cent. This should require a run of 8 minutes and the diagram shows an 8 minute run. In the first two runs of both air brakes they reduced speed too quickly, causing bad shocks and irregular speed. In the run illustrated, to avoid this danger, both brakes maintained too high a speed, finishing their run in less than 8 minutes.

The American brake reduced speed quite promptly at first by a slight application of the driver brakes. The latter were then released and the train continued for the remainder of the run by its own undulations without any overt provoking cause. This caused quick and sudden variations of speed, each being accompanied by a violent shock in the rear, which would seem to almost stop the train, after which the speed would increase until another shock came. Each of the sharp points in the American speed chart represents one of these shocks. There were 28 in all, 20 of which are represented on the engraving. The train broke in two at two points from a violent shock before it had made more than 1½ miles, but the speed was so low that even this left the run longer than 8 minutes.

There is an appearance of some such sudden fluctuations of speed in the other two diagrams, but there was no such effect. They appear to us to be in part errors of the draftsman who had to condense the very long diagram. From observation of the behavior of the brakes on the train we apprehend that the angles in the speed line of the two air brakes are rather too sharp, and of the American not sharp enough. As to this, however, it is difficult to judge exactly. The general facts of the run are sufficiently evident, with this explanation.

* See right-hand column, page 540, in our issue of Aug. 6.



THE BURLINGTON BRAKE TESTS.

Regulated speed down grade of 53 ft. per mile.

Tests as to Value of Slack for Starting Trains.

It will be remembered that in our report of the Burlington brake tests a great decrease in the violence of the shocks from sudden application was caused by taking out about 3 in. of loose link slack between each car by an iron block, leaving ⅛ in. to 1 in. loose slack, 7 to 7½ in. of spring slack still in the train. This led, as was stated, to planning a further test of the effect of taking out this slack on the starting capacity of engines, of which the following is a report. The general substance of the test was that there was practically no difference, but as much of the conclusiveness of the tests depends upon the details of the handling of the engine and the behavior of the train, we give the record in more detail than would otherwise seem necessary.

The total slack in the train, or the difference between springs extended and springs compressed by the full power of the engine, as measured on 12 cars, was as follows:

	For 11 couplings.	For 1 car.
Westinghouse, C. B. & Q. cars	10 ft. 0 in.	11 in.
Eames, I., D. & S. cars	11 " 5½ "	12½ "
Rote, C., R. I. & P. cars	10 " 0 "	11 "

Of this there was:

Link slack	3 to 3½ in.
Free draw-bar slack, about	⅛ "
Spring slack (twice the motion of two springs), 9 in. if all motion of springs were exhausted, but probably only	7½ to 8½ "

Counting the spring slack as equal to half as much free slack there was about 8 in. of free slack in the Westinghouse cars, of which 3 in. was taken out by wedges in the close-coupling tests.

The tests were made with a train of 50 Chicago, Burlington & Quincy cars, 49 of which were loaded with 40,000 lbs. each of car-wheels, hauled by Chicago, Burlington & Quincy engine 119. The following was the weight of the train:

Engine, 17 × 24 in. cylinders, 63 in. drivers, American type.

	Lbs.	Lbs.
On drivers	53,080	
On truck	28,150	81,230
Tender		24,700
Tender load		30,300
	Tons.	
Total engine and tender	68.115	136,230
Dynamometer car	15.375	30,750
50 cars, average	24,086 lbs. each.	
Load	40,000 " "	
Total	64,086 " "	
	32.043 tons.	1,602.15
Total		1,685.64
Less for 1 empty car		20.
Total weight of train of 50 cars		1,665.64

The first series of tests were made on the open road, on a slight "hog-back" in a nearly level grade, as follows:

TESTS WITH SLACK.

First test.—Pilot of engine at post for stop No. 1, headed east. Train standing on an average grade of 0.05 per cent. down; average grade for 1,000 ft. beyond stop-post, 0.17 per cent. Full head of steam in this and all other tests. Safety valve set to blow off at 150 lbs., and stop blowing at 145 lbs. No brakes set on rear of train. Sand used freely.

Engine backed about 2 ft.; then started ahead. Slipped once, but not badly; then kept going for several hundred feet. Dynamometer diagram showed an average traction of 18,300 lbs., which had not begun to diminish when the test was stopped after running some 500 ft.

It was clear from this test that the grade was too favorable for the load, since the train was started easily. The use of sand also was abandoned after this test.

Second test.—No sand in this or any later tests. Engine backed to a point 990 ft. west of stop-post No. 1. Average grade, 0.15 up; front half of train on a level; rear half on a 0.3 up grade. No brakes set on rear cars. Nearly all the slack out of train.

Engine moved 40 ft. and stalled, but moved all the cars slightly. Slipped drivers somewhat, but not badly. Traction 18,000 lbs.

Third test.—Engine backed to a point 1,145 ft. west of stop-post No. 1, increasing total grade resistance of train some 800 lbs.

Engine backed 4 ft., went ahead a short distance and stalled. Backed 10 ft. and tried again, but failed.

Fourth test.—Three hand brakes set at rear to assist in utilizing slack. Engine still further west, giving an increased resistance. Average grade, 0.225; front quarter of train on a level, rear on 0.3 grade.

Engine ran 80 ft. and stalled, slipping drivers considerably with a chattering motion.

Fifth test.—48 cars. Three brakes set at rear. Engine 100 ft. further east; 600 ft. of train on a level, rear on 0.3 grade, average 0.24. Down grade of 0.2 in front of engine, so that every car length moved took off 320 lbs. (32 tons × 10 lbs. per ton = grade resistance on 0.5 grade) of tractive resistance, or about ⅛ lb. per ton of entire train.

Engine ran 300 ft. very slowly, with considerable chattering slipping, then gained speed very gradually for 200 ft. further, when the test was stopped.

The iron blocks were then inserted in the links to take out 3 in. of the 4 in. of loose link slack.

TESTS WITHOUT SLACK.

First test.—Average grade and other conditions as in fifth test above, but with 50 cars. Engine ran 37 ft. and stalled.

Second test.—49 cars. Grade and other conditions the same. Engine started off easily with very little slipping for 275 ft. Then slipped somewhat badly once, but continued to gain speed slowly for 525 ft., when the test was concluded.

In all the preceding tests, where not otherwise stated, the slack was taken up and springs compressed, so far as possible, by the engine when backing to position before the test began. The average tractive force was in all about 18,000 lbs. It appeared questionable whether sand at all increased the average tractive force, but what it did do was to decrease the danger of slipping, so that the omission of its use in all but the first test was perhaps unfortunate.

The strain occasionally thrown upon the link in these tests rose from 30,000 to 33,000 lbs.

The same train was again tested in the afternoon of the same day in the West Burlington yard, on the track shown in the accompanying engraving. In these tests, as in all the preceding, it will be seen that every car-length the engine moved forward decreased the average tractive resistance of the train by transferring one car from the 0.5 to the 0.15 grade, a gain of 7 lbs. × 32 tons = 224 lbs. per car, or 0.17 lbs. per ton of entire train as finally started. Notwithstanding this advantage, the chief difficulty which developed was not in starting the cars in the strict sense of the word, but in keeping them moving after they were started. The engine in almost every test varied a few feet from the position indicated in the cut, but except as noted not sufficiently to make any serious difference. The tests began with the slack taken out by the blocks, one car after another being dropped off until the capacity of the engine was reached in the thirteenth trial, with 38 cars. The blocks were then taken out to put the full slack in the train and tests begun with 38 cars, with the intention of adding one car after another until the full capacity was reached. So little difference was found, however, in the ease with which 38 cars could be started, and the time remaining was so short, that the tests were not continued, although 39 or 40 cars could probably have been started. In all the following tests there was much slipping and chattering, and very careful handling of the locomotive was necessary, and was given, to prevent too much loss of traction from this cause.

TESTS WITHOUT SLACK.

First test.—50 cars. Moved 14 ft. and stalled.

Second test.—50 cars. Moved 11 ft. back, then ahead 52 ft. and stalled, chattering and slipping a good deal, especially where water from the pet-cocks had wet the rail.

Third test.—48 cars. Backed 1 ft., then went ahead 32 ft. and apparently stopped, then ahead 28 ft. and stalled, all with considerable slipping.

Fourth test.—48 cars. Ran 70 ft. and stalled.

Fifth test.—47 cars, starting 20 ft. further ahead. Ran 51 ft. and stalled.

Sixth test.—46 cars. Backed some 5 ft. then ran ahead 61 ft. and stalled.

Seventh test.—45 cars. Ran 71 ft. and stuck, slipping much.

Eighth test.—44 cars. Ran 94 ft. in all, very slowly and with much slipping, and stalled.

Ninth test.—43 cars, starting 20 ft. further back with corresponding increase of traction required. Ran 80 ft. in all and stalled.

Tenth test.—41 cars. Moved about the same distance as before (not accurately recorded) and stalled.

In this, as in most of the other tests, an initial compression of the springs of about 12,000 lbs. was indicated by the dynamometer, being within 2,000 lbs. of their ultimate capacity. That a great deal of force was thus stored in the springs was curiously indicated in the thirteenth test, in which, while the engine was backing against the train to compress the springs the drivers began to slip and the engine was then pushed backward by the springs some 4 or 5 ft. against the resistance of its slipping drivers.

Eleventh test.—40 cars. Ran 96 ft. in all and stalled.

Twelfth test.—39 cars. Ran 80 ft. and then apparently came to a dead stop after each of two or three half revolutions. Ran 163 ft. in all and stalled.

Thirteenth and final test—38 cars. After compressing springs as much as possible, as in the other tests, with the result just detailed, ran 550 ft. very slowly, with much slipping and with hardly any increase of velocity, but with enough to show that the train was no longer in danger of stalling. Had not the grade been growing more favorable as the train advanced, it did not appear at all likely that this number of cars could have been started. Probably not over 35.

The loose coupling test was then begun, with 38 cars, all advantage being taken of the springs as before. The train pulled out with perceptibly greater ease, but still with so much slipping and so slowly as to make it clear that the advantage of the slack under the conditions of the test was not so great but that the addition of one or two more cars would stall the train. Further trials were therefore suspended.

In all this latter series of tests, at West Burlington, the average tractive force indicated by the dynamometer diagram was for some reason considerably less than in the first series, and fell somewhat during the tests. An average would be 17,000 lbs. at the beginning of the second series

RAILROAD EARNINGS IN JUNE.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1886.	1885.	Inc.	Dec.	P. c.	1886.	1885.	Inc.	Dec.	P. c.	1886.	1885	Inc.	Dec.	P. c.
EASTERN ROADS.															
Balt. & Potomac	92	92				$ 108,450	$ 103,957	$ 4,493	$	4.3	$ 1,179	$ 1,130	$ 49	$	4.3
Buff., N.Y. & Ph.	663	663				226,560	211,557	15,003		7.1	342	319	23		7.1
Buff., Ro. & Pitts	294	294				76,440	106,255		29,815	27.7	260	361		101	27.7
Camden & Atlan.	79	79				53,341	50,388	2,953		5.9	675	638	37		5 9
Danbury & Nor.	37	37				19,264	18,549	715		3.9	521	501	20		3.9
Grand Trunk	2,998	2,998				1,307,676	1,102,281	205,395		18.6	436	368	68		18.6
Long Island	354	354				295,539	284,258	11,281		4.0	835	803	32		4.0
N. Y. C. & H. R.	1,541	993	548		55.2	2,664,245	1,972,915	691,330		35 0	1,729	1,987		258	13.0
N. Y. City & No.	54	54				47,236	40,182	7,054		17 6	875	744	131		17.6
N. Y., L. E. & W.	1,075	1,075				1,536,808	1,202,186	334,6 2		27 9	1,430	1,118	312		27.9
N. Y. & N. Eng.	392	392				314,317	271,057	43,260		16 0	802	691	111		16.0
N. Y., Ont. & W.	321	321				120,288	106,801	13,487		12.6	375	333	42		12.6
N. Y., Sus. & W.	153	150	3		2.0	84,157	90,222		6,165	6.8	549	601		52	8 7
Northern Cen.	322	322				432,536	416,219	16,317		3.9	1,343	1,293	50		3.9
Penn. Railroad	2,340	2,268	72		3.1	4,336,102	3,735,639	600,463		16.0	1,853	1,647	206		12.6
Phila. & Reading	1,560	1,560				2,532,364	2,428,293	104,071		4.3	1,623	1,557	66		4.3
West Jersey	200	200				115,380	111 048	4,332		3.9	577	555	22		3.9
Total, 17 roads	12,475	11,852	623			14,270,603	12,251,807	2,054,776	35,980		1,145	1,032	113		
Total inc. or dec.			623		5.2			2,018,796		16.5			113		11.0
SOUTHERN ROADS.															
Ala. Great So.	290	29.				88.345	68.011	20,334		29.9	305	235	70		29.9
Cin., N. O. & T.P	336	336				229,304	206,386	22,918		11.1	684	614	70		11.1
Ill. Cen., So. Div.	711	711				230.078	234,120		4,042	1.7	324	329		5	1.7
Louis. & Nash.	2,015	2.015				1,089,470	1,038.172	51.198		4.9	541	515	26		4.9
L., N. O. & Tex.	533	533				101.679	67,147	34,532		51.5	191	125	66		51.5
Miss. & Tennessee	100	100				22.949	31,552		86,603	27.2	2:9	315		86	27 2
Mobile & Ohio	527	527				117,688	108,785	8.903		8 2	2 3	206	17		8.2
N., Chat. & St. L	580	580				178,139	147,703	30,439		20.6	307	255	52		20.6
N. O. & North E.	195	195				40,112	36,900	3,212		8.7	206	189	17		8.7
N. N. & M. Vy. Co:															
Ches. & Ohio.	502	502				322.799	249,521	73,' 78		29.3	643	497	146		29.3
Ches., O. & S. W	399	399				122.607	113.361	9.246		8.2	307	284	23		8.2
E., Lex. & B. S.	130	130				67,412	52,761	14,651		27.6	519	406	113		27.6
Norfolk & West.	510	510				228.126	191,767	36.359		19.0	447	376	71		19.0
Rich. & Danville	757	757				266.900	266.294	606		0.2	353	352	1		0.2
Ch., Col. & A.	377	377				46.650	42,745	3,905		9.1	124	114	10		9.1
Col. & Green'e.	296	296				23,700	30 974		7,274	23.5	80	105		25	23.5
Ga. Pacific.	317	310	7		2.3	36.083	28 690	7,393		25.5	114	91	23		25.5
Va. Midland	352	352				121,908	118 993	2,915		2.5	346	338	8		2.5
West. N. Caro.	286	274	12		4.4	44.028	35,162	8,866		25.3	154	128	26		20.4
South Carolina	246	246				62.419	50,523	11,896		23.6	254	205	49		23 6
Vicks. & Merid'n	142	142				32,486	25,269	7,217		28.8	229	178	51		28.8
Total, 21 roads	9,601	9,582	19			3,472,782	3,144,833	347,868	19.919		362	328	34		
Total inc. or dec.			19		0.2			327,949		10.4			34		10.3
CENTRAL GROUP.															
Cairo, V. & Chi.	265	265				54.888	32,631	22.257		67.4	207	123	84		67.4
Chi. & East. Ill.	252	252				128,524	116 812	11,712		10.0	510	464	46		10.0
Chi. & W. Mich.	413	413				118,949	117,266	1,683		1.4	288	284	4		1.4
C., I., St. L. & C.	342	342				188,199	179.276	8,923		5.0	550	524	26		5 0
C., Wash. & Balt.	281	281				146.200	114,206	31,994		28.1	520	406	114		28.1
Clev., Ak. & Col.	144	144				46,963	44,048	2 915		6.6	326	306	20		6.6
Cleve. & Canton.	161	161				32,982	26,042	6,940		26.7	205	162	43		26.7
Col., H. V. & T.	328	324	4		1.2	179,208	190,689		11,481	6.0	546	589		43	7.2
Det., Lan. & No.	261	261				96.717	103,209		6,492	6.3	370	395		25	6.3
Ev. & T. Haute	146	146				60,012	55,511	4,501		8.0	411	380	31		8.0
Flint & Pere M.	362	362				168.080	157,721	10 359		6.6	464	436	28		6 6
Ill. Cen., Ill. lines	953	953				513,798	529,487		15,689	3.0	539	556		17	3.0
Ind., Bl. & West.	532	532				196,934	167,567	29.367		17.6	370	315	55		17.6
Ind., Dec. & Sp.	152	152				28.775	24,153	4,622		19.2	189	150	30		19.2
L., Ev. & St. L.	253	253				61,086	56,003	5,083		9 1	241	221	20		9 1
N. Y., Penn. & O.	587	587				515,731	367,274	148,457		40.4	879	626	253		40.4
Ohio & Mississip.	615	615				308,119	264,201	43 918		16.6	501	430	71		16.6
Ohio Southern	130	130				33,689	26,875	6,814		25.2	259	207	52		25.2
Peoria, Dec. & Ev.	254	254				55,347	47,945	7,402		15.4	218	189	29		15.4
St. L., Al. & T. H.:															
Main line	195	195				94,116	87,656	6,460		7.4	483	450	33		7.4
Belleville line	138	138				51.910	47,534	4,376		9.1	376	344		32	9.1
T., A. H. & N. M.	61	61				24,226	23,256	970		4.2	397	381	16		4.2
Wab., St. L. & P.	2,140	2,140				962,740	804,394	158,346		19.7	450	375	75		20.0
Total, 23 roads	8,965	8,961	4			4,067,193	3,583,756	517,090	33,662		454	400	54		
Total inc. or dec.			4					483,437		13.5			54		13.5
NORTHWESTERN ROADS.															
Bur. Ced R. & No.	990	990				218,124	230,451		12,327	5.4	220	233		13	5.4
Central Iowa	500	500				87,321	80.739	10,582		12.2	194	173	21		12.2
Chi. & Alton.	850	850				625.022	591,200	33,822		5.6	735	695	40		5.6
Chi., Bur. & Q.	3,680	3,467	213		6.2	2,148,532	2,992,485	156,047		7 8	584	575	9		1.6
Chi., Mil. & St. P.	4,932	4,804	128		2.7	2,064,000	1,865,499	198,501		10.6	418	388	30		7.6
Chi. & Northw.	4,055	3,840	215		5.6	2,142,300	1,997 679	144,621		7.3	528	520	8		1.5
C., St. P., M. & O	1,340	1,320	20		1.5	494 000	470,508	23,492		4.9	369	356	13		3.7
Des M. & Ft. D.	143	143				22,138	27,329		5,191	19.2	155	191		36	19.2
Ill. Cen., Ia. lines	402	402				132.620	136,785		4,165	3.0	330	340		10	3.0
Mar., H. & Ont.	160	160				134.619	124,965	9 654		7.7	841	781	60		7.7
Mil., L. S. & W.	533	491	42		8.6	234,670	108,486	126,184		116 0	440	221	219		99.1
Mil. & Northern.	227	227				47,630	47,299	331		0.7	210	208	2		0.7
Wisconsin Cen.	450	450				117,840	126,653		8,813	7.0	262	281		19	7.0
Total, 13 roads.	18,262	17,644	618			8,478,816	7,806,078	703.234	30,496		464	442	22		
Total inc. or dec.			618		3.5			672,738		8.6			22		5.0
ROADS NORTHWEST OF ST. PAUL.															
Canadian Pac.	3,527	3,064	463		14.9	805,923	734,862	161,061		21.9	254	240	14		5.8
Northern Pac.	2,778	2,453	325		13.2	1,077,356	1,012,507	64,849		6.3	388	413		25	6.1
St. P. & Duluth.	225	225				143,505	124,735	18,770		15.0	638	554	84		15.0
St. P., Minn. & M	1,485	1,471	14		0.9	471,062	511,615		40.553	7,9	317	348		31	8.8
Total, 4 roads.	8,015	7,213	802			2,587,846	2,383,719	244.680	40,553		323	330		7	
Total inc. or dec.			802		11.1			204,127		8.6				7	2.1
SOUTHWESTERN ROADS.															
G., C. & S. Fe.	660	536	124		23.1	161.358	123,426	34,932		27.7	244	236	8		3.4
K. C., Ft. S. & G.	389	389				195,511	200,031		4,520	2.3	503	514		11	2.3
K. C., S. & Mem.	282	282				130.387	107,788	22,599		20.9	462	382	80		20.9
Little R. & Ft. S.	170	170				41,366	31,957	9,409		29.4	243	188	55		29.4
Lit. R., M. R. & T.	170	170				23,225	17,746	5,479		30.9	136	104	32		30.9
St. L., Ark. & Tex.	735	735				96,020	69 851	26,169		37.4	131	95	36		37.4
St. L. & San F.	870	814	56		6.7	362,447	339,377	23,070		6.8	417	417			
South. Pac. Co.:															
N. O.—S. A. lines	760	760				403,822	4 2,451	1,371		0.3	531	529	2		0.3
V., Shreve. & Pa.	170	170				26,452	26,966		514	1.9	156	159		3	1.9
Total, 9 roads.	4,206	4,026	180			1,440,588	1,322,593	123,029	5,034		343	328	15		
Total inc. or dec.			180		4.5			117,995		8.9			15		4.5
FAR WESTERN AND PACIFIC ROADS.															
A., T. & S. Fe.	2,418	2,375	43		1.8	1,252,754	1,218,772	33,982		2.8	518	513	5		0.9
Den. & Rio G.	1,317	1,317				560,258	525,341	34,917		6.7	424	399	25		6.7
Den. & Rio G. W.	368	368				88 800	88,080	720		0.8	241	239	2		0.8
G., H. & San A.	933	933				201.966	225,587		23,621	10.4	217	242		25	10.4
St. J. & G. Isl'd.	252	252				88.077	68,231	79.846		29.2	350	271	79		27.2
Texas & Pacific.	1,487	1.487				403,069	371.483	31,586		8.5	271	250	21		8.5
Union Pacific.	4,526	4,499	27		0.6	2,293,822	1,955,395	308,427		15.8	506	435	65		15.0
Total, 7 roads.	11,301	11,231	70			4,858,746	4,452,889	429,478	23,621		430	396	34		
Total inc. or dec.			70		0.6			405,857		9.1			34		8.5
GRAND TOTAL:															
Total, 94 roads	72,825	70,509	2,316			39,176,574	34,945,675	4,420.164	189,265		538	495	43		
Total inc. or dec.			2,316		3 3			4,230,899		12.1			43		8.7

RAILROAD EARNINGS, HALF-YEAR TO JUNE 30.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1886.	1885.	Inc.	Dec.	P. c.	1886.	1885.	Increase.	Decrease.	P. c.	1886.	1885.	Inc.	Dec.	P. c.
EASTERN ROADS.															
Balt. & Potomac.	92	92				$ 629,914	$ 655,542	$	$ 25,628	3.9	$ 6,847	$ 7,125	$	$ 278	3.9
Bost. & Albany..	384	384				3,800,457	3,507,413	293,044		8.3	9 897	9,134	763		8.3
Buf., N. Y. & P..	663	663				1,200,63	1,083,441	117,195		10.8	1,811	1,634	177		10.8
Buf., Roch. & P.	294	294				508,208	554,512		46,304	8.2	1,729	1,886		157	8.2
Cam. & Atlantic.	79	79				214,525	206 038	8,487		4.0	2.712	2.608	1 4		4.0
Dan. & Norwalk.	37	37				99.670	94,853	4,817		5.1	2.694	2.564	130		5.1
Grand Trunk....	2,998	2,981	17		0.6	7,437,873	6,833,637	604.236		8.8	2,481	2.292	189		8.2
Long Island.	354	354				1,226,481	1,169 445	57.036		4 9	3,465	3,304	161		4 9
N. Y. C. & H. R.	1,541	993	548		55.2	14,912,612	11,565,857	3,346,753		28.9	9,677	11.647		1,970	16.9
N. Y. City & N..	54	54				254,350	198,905	55,745		28.0	4,710	3,678	1,032		28 0
N.Y., L. E. & W.	1,075	1,075				8,523.772	7,094 153	1,429 619		20 1	7,929	6.599	1,330		20.1
N. Y. & N. Eng..	392	392				1,792,154	1,513 915	278,239		18.4	4,572	3,862	710		18.4
N. Y., N. H & H	265	265				3,495,790	3,190,095	305 695		9.6	13.192	12,038	1,154		9 6
N. Y , Ont. & W.	321	321				572.767	545.156	27,611		5.1	1,784	1.638	86		5 1
N. Y , Sus. & W.	152	150	2		1.3	503.788	496,116	7,672		1.5	3,314	3.307	7		0.2
Northern Cen.. .	322	322				2,582,401	2,597.772		15,371	0.6	8,020	8,068		48	0.6
Penn. R. R.....	2,365	2,268	57		2 5	23,250 171	21,319.600	1,930,571		9.1	10,000	9,400	600		6.4
Phila & Read..	1,560	1,560				13,420,718	12,710,202	710,516		5.6	8.603	8,148	453		5.6
West Jersey.....	200	200				545,638	510,793	34,845		6 8	2,728	2,554	174		6.8
Total, 19 roads.	13,108	12,484	624			84,971 925	75,847,145	9,212.083	87,303		6,482	6,076	406		
Tot. inc. or dec.			624		5.0			9,124,780		12.0			406		6.7
SOUTHERN ROADS.															
Ala. Gt. South..	290	290				544,874	519,610	25,264		4.9	1,879	1,792	87		4.9
Cin , N. O. & T. P	336	336				1.282,446	1,207.659	74,787		6.2	3,817	3.594	223		6.2
Ill. Cen., S. Div.	711	711				1,797.947	2,114.928		316.981	15.0	2,529	2.975		446	15 0
Louis. & Nash..	2,015	2,048		33	1.6	6,298,046	6,834,858		536,812	7.9	3,125	3 337		212	6 3
Louis.,N. O. & T.	533	481	52		10.8	731.477	533,229	198,248		37.2	1.372	1.109	263		23.9
Miss. & Tenn ...	100	100				180,341	234,602		54,211	23.1	1,804	2.346		542	23.1
Mobile & Ohio ..	527	527				839,580	916,997		77,417	8.4	1.593	1,740		147	8 4
Nash., C. & St. L.	580	580				1,080 809	1.027,218	53,591		5.2	1,863	1,771	92		5.2
N. Or. & N. E...	195	195				300,571	345,380		44,809	13.0	1.541	1,771		230	13.0
N. N. & M V. Co.:															
Ches. & Ohio..	502	502				1,8.9.817	1,566,415	253,402		16.2	3.625	3,108	517		16.2
Ches ,O. & S.W	399	399				730.269	701,625	28,644		4 1	1,830	1,758	72		4.1
Eliz., L. & B. S.	130	130				393 457	316,008	77.449		24 5	3,026	2,431	595		24.5
Nor. & West.....	510	510				1,449,388	1,237,030	212.358		17.0	2,842	2,425	417		17.0
Rich. & Dan.....	757	757				1,881.651	1,855 573	26,078		1.4	2,486	2,451	35		1.4
C., Col. & Aug.	377	377				377.436	379,024		1,588	0.4	1,001	1.005		4	0 4
Col. & Green..	296	296				305 724	317,752		12,028	3.8	1,033	1,073		40	3.8
Geo. Pacific..	317	310	7		2.3	335.141	288,183	46,958		16.3	1,057	930	127		13.7
Vir. Midland ..	352	352				678,308	689,015		10,707	1.5	1.927	1,957		30	1.5
Western N. C..	286	274	12		4.4	239,799	213,725	26,074		12.2	838	780	58		7.4
So. Carolina. ...	246	246				521.013	532,993		11,980	2.3	2,118	2,162		44	2.3
Vick.& Meridian.	142	142				238,215	198,121	40,094		20.3	1.678	1,395	283		20.3
Total, 21 roads.	9,601	9,563	71	33		22,026,359	22,029,945	1,062,947	1,066,533		2,294	2,304		10	
Tot. inc. or dec.			38		0.4				3,586					10	0.4
CENTRAL GROUP.															
Chi. & East. Ill..	252	252				785.633	742,399	43,234		5.8	3,118	2,946	172		5.8
Chi. & West. M..	413	413				652,034	601,901	50.133		8.3	1.579	1,457	122		8.3
C., I., St. L. & Ch	342	342				1,195,904	1,149.624	46,280		4.0	3.497	3,362	135		4.0
C.,Wash. & Balt.	281	281				910,216	834.475	75.741		9.1	3.239	2,970	269		9.1
Cleve , Ak. & Col	144	144				240 971	231,113	9.858		4.3	1,673	1,605	68		4.3
Clev. & Canton..	161	161				160,742	142,868	17,874		12.5	998	887	111		12.5
Col., H. V. & Tol	328	324	4		1.2	1,045,789	1,069.748		23,959	2.2	3,188	3,302		114	3.4
Det., Lans. & No	261	261				562,584	553,846	8.738		1.6	2,156	2.122	34		1.6
Ev. & Terre H...	146	146				338,334	329,030	9,304		2.8	2,317	2.254	63		2.8
Flint & Pere Mar	362	362				1.073.402	932.109	141,293		15.2	2,965	2,575	390		15.2
Ill. Cent., Ill lines	953	933				2,887,740	3.021,303		133,563	4.4	3,030	3,170		140	4.4
Ind., Bloom.& W	532	532				1,140,998	1,061,221	69,777		6.3	2,126	1,995	131		6.3
Ind., D. & Spring	152	152				180,619	152,363	28,256		18.6	1,188	1,002	186		18.6
L. S. & Mich. So.	1,340	1,340				6,951,786	6,487,654	464 132		7.2	5,188	4,842	346		7.2
Louis., E. & St. L	253	253				373,916	318,244	55,732		17.5	1,478	1,258	220		17.5
Michigan Cent..	1,515	1,505	10		0.7	5,436 000	4,973,000	463,000		9.3	3,588	3,304	284		8.6
N. Y., C. & St. L.	523	523				1,732,835	1,509,158	223.677		14.8	3,313	2 886	427		14.8
N.Y., Penn. & O	587	587				2.843,038	2,249,990	593,048		23.6	4 843	3,915	925		23.6
Ohio & Miss. ...	615	615				1,730 719	1,738,4 5		7,696	0.4	2,814	2,827		13	0.4
Ohio Southern...	130	130				226,581	201.775	24,806		12.3	1.743	1,532	101		12 3
Peoria, D. & E...	254	254				232,946	328,490	4,456		1.4	1,311	1,293	18		1.4
St L., Al. & T H:															
Main line	195	195				562.372	573,340		10.968	1.9	2,884	2,940		56	1.9
Belleville line..	138	138				324,434	349,787		25,353	7.2	2,351	2,535		184	7.2
Wab., St. L. & P.	2,250	2,250				5,841,968	5,494,356	347,612		6.3	2,596	2,442	154		6.3
Total, 24 roads	12,127	12,113	14			37,521,601	35,096,189	2,62 ,951	201,539		3,094	2,897	197		
Tot. inc. or dec			14		0.1			2,425,412		6.9			197		6.8
NORTHWESTERN ROADS.															
Bur., C.Rap & N.	990	990				1,265,633	1,413,918		148,285	10.5	1,278	1,428		150	10.5
Central Iowa....	500	500				594,580	567,304	27,276		4.8	1,189	1,135	54		4.8
Chi. & Alton ...	850	850				3,495,558	3.638.936		143,378	3.9	4.112	4,281		169	3.9
Chi., Bur. & Qui.	3 652	3,467	185		5.3	11,523,358	12,372.967		849,609	6.9	3,155	3,569		414	11.8
Chi. Mil. & St. P.	4,923	4,804	119		2 5	10.639.000	10.611,958	27.042		0.2	2,161	2 209		48	2.3
Chi. & No. West.	3,961	3,833	128		3.3	10.835,849	10.680.289	155,560		1.4	2,736	2,786		52	1.9
Ch., St.P., M. & O	1,340	1.320	20		1.5	2,689.446	2,510,871	178,575		7.1	2.007	1,902	105		5.5
Des M. & Ft. Do.	143	143				150,842	169,287		18,445	10.9	1 055	1,184		129	10.9
Ill. Cen., Ia. lines	402	402				762,753	749.720	13.033		1.7	1,897	1,865	32		1.7
Marq., H. & O...	160	149	11		7.3	375,209	284,554	90.655		31.8	2,345	1,910	435		22.9
Mil., Lake S. & W	533	491	42		8.6	927,788	565 653	362,135		64.0	1,765	1,152	613		53.3
Mil. & Northern.	227	227				291,667	273,977	17,690		6.4	1,285	1,207	78		6.4
Wis. Central....	450	450				677,635	716.309		38,674	5.4	1,506	1,592		86	5.4
Total, 13 roads	18,131	17,626	505			44,229,318	44,555,743	871,966	1,198,391		2,439	2,528		89	
Tot. inc. or dec			505		2.9				326.425	0.7				89	3.6
ROADS NORTHWEST OF ST. PAUL.															
Canadian Pacific	3,527	3.019	508		16.9	4,160,343	3,352.827	807.516		24.1	1,180	1.111	69		6.3
Northern Pacific	2,753	2,453	300		12.2	4,988,256	4,606,431	381,825		8.3	1,812	1,878		66	3.5
St. P. & Duluth.	225	225				567 164	469,804	97,360		20.7	2,521	2,088	433		20.7
St.P.,Min.& Man	1,485	1,471	14		0.9	2,934.816	3,146,918		212,102	6.7	1,976	2,140		164	7.7
Total, 4 roads..	7,990	7,168	822			12,650,579	11,575,980	1,286,701	212.102		1,583	1,615		32	
Tot. inc. or dec			822		11.4			1,074,599		9.3				32	1.9
SOUTHWESTERN LINES.															
Gulf, Col. & S. F.	637	536	101		18.8	911,386	590.304	312,082		52 0	1,415	1,118	297		27.0
K. C., Ft. S. & G.	389	389				1,188,242	1,262,755		74,513	5.9	3,055	3,246		191	5 9
Kan.C., Spr. & M.	282	282				701.035	831,458		130,423	15.7	2.486	2,948		482	15.7
Little R. & Ft. S.	170	170				270,509	245,285	25,224		10 3	1,591	1,443	148		10.3
L. R.,M. R. & T.	170	170				159,236	145.177	14.059		9.7	937	854	83		9.7
St. L., A. & Tex.	735	735				684,934	438.162	246,772		56.3	932	596	336		56.3
St. L. & San Fran	852	814	38		4.7	2,029.503	1,987,002	42,501		2.1	2,382	2,441		59	2.4
South. Pac. Co.:															
N.O.-S A lines	760	681	79		11.6	2,788,947	2,644,328	144,619		5.5	3,670	3,883		213	5 7
Vicks.,Sh. & Pac.	170	170				196,846	161,612	35,234		21.7	1,158	951	207		21.7
Total, 9 roads.	4,165	3,917	218			8,930,638	8,315,083	820.491	204.936		2,144	2,107	37		
Tot. inc. or dec.			218		5.5			615,555		7.4			37		1.8
FAR WESTERN AND PACIFIC ROADS.															
At., Top. & S. F.	2,416	2,375	41		1.7	6.941,367	7.227.256		285,889	3.9	2,873	3,043		170	5.6
Denver & R. G..	1,317	1,317				2,884.813	2,732,438	152,375		5.6	2,190	2,075	115		5.6
Denv. & R. G. W.	368	368				466 911	433,524	33,387		7.5	1,269	1,178	91		7.5
G., H. & San An.	933	933				1,233,339	1,383.660		150,321	10.8	1,322	1,483		161	10.8
St. Jo. & Gr. Isl'd	252	252				546,983	497 518	49,465		9.9	2,171	1,974	197		9 9
Tex. & Pacific...	1,487	1,487				2,530,087	2,165.431	364,656		16.8	1,701	1,456	245		16.8
Union Pacific ...	4,521	4,498	23		0.5	11,606,088	11,224.530	381,558		3.4	2.567	2,495	72		2.9
Total, 7 roads.	11,294	11,230	64			26,209.588	25,664,357	981.441	436,210		2,321	2,285	36		
Tot inc. or dec.			64		0.6			545,231		2.1			36		1.6
GRAND TOTAL:															
Total, 97 roads..	76,416	74,131	2,318	33		236,540,008	223,084,442	16,862,580	3,407,014		3,095	3,009	86		
Total inc. or dec.			2,285		3.1			13,455,566		6.0			86		2 9

and 16,500 at the end, against 18,000 lbs. full in the first tests. The only apparent explanation was a difference in the condition of the surface of rail and wheel, which appeared good at both points, except that the engine wet the rail somewhat.

It is a little difficult to see how an engine of these dimensions, with the given steam pressure, could exert so great a tractive force. Pending inquiries in this respect there appears no reason to question that the traction indicated by the dynamometer is essentially correct. Even if there were error in this respect the comparison between close and loose couplings is not affected thereby.

Computing the resistances, we find that the average rolling friction in the first four or five car-lengths ran very uniformly at 10½ to 12 lbs. per ton in the first series of tests. In the second series, allowing a tractive force of 17,000 lbs. per ton, the average pull of the engine per ton of train (1,801 tons) was 13.07 lbs., while the grade resistance alone averaged 7.4 lbs. per ton, leaving only 5.1 lbs. per ton for rolling friction. Detailed and recent levels were not available for this section as for the other, however, and ballasting had been done since the profile used was made, probably with the effect of decreasing the 0.5 grade somewhat. The first results are, therefore, the most trustworthy.

THE SCRAP HEAP.

He Practised Economy.

A few days ago a conductor from a Minneapolis railroad was visiting in the park with his wife. On this road conductors are paid a salary of $75 per month. That's what the company pays them. The wife of this conductor was talking with some other ladies at the table at the hotel. As is natural with women, the conversation ran into political economy. "Yes, living is very high in Minnesota," said the wife of the knight of the punch; "we find it almost impossible to save more than $100 per month out of my husband's salary." "Where do you board?" "At a hotel in Minneapolis." "What do you pay?" "Seventy-five dollars per month." "Yes, it's lots of money."—*Minneapolis (Minn.) Tribune.*

Fast Time.

The newspaper train on the New York Central on Sunday made a remarkable run, the time between Syracuse and Buffalo being claimed to be the fastest ever made in this country over the same distance. The train, which consisted of a coach and baggage car, is due to leave Syracuse at 9.25 a. m., but on Sunday it was 10 o'clock before the start was made. The train, which was drawn by engine No. 541, John Cool, driver, was in charge of Peter Wagner, as conductor. The train was put to its best speed and the run of 149 miles to this city was made in 144 minutes, including a stop of 6 minutes at Rochester, leaving the actual running time but 138 minutes. The fastest run was from Syracuse to Fairport, 70¼ miles, in 61 minutes 20 seconds; the distance from Syracuse to Rochester, 81 miles, being made in 72 minutes, and from Rochester to Buffalo, 68 miles, in 66 minutes. For a part of the time mile after mile was traveled in less than 52 seconds.—*Buffalo Express*, Aug. 10.

Attempt at Train Robbery.

A dispatch from Indianapolis, Aug. 5, says: "After midnight this morning another desperate attempt was made to repeat the famous Monon express robbery committed near Harrodsburg, Monroe County, a year ago. As No. 3 passenger train, the train that also carries the express, was going north at the rate of 25 miles an hour, when between Greencastle and Crawfordsville, the baggageman, J. P. Winchester, heard somebody kicking at the south outer door of the baggage car. The door was heavily chained, but Winchester thought it was some one of the train crew, and at once opened the door. No sooner had it been unfastened than a burly man pushed it open, and, leveling a revolver at Winchester, fired, the ball taking effect in his breast. Winchester was unable to protect himself, but the express messenger, George Perkins, who was in the same car, at once grabbed for his revolver that was in a rack at his side, and the robber, seeing him, began to retreat, and the messenger commenced firing, compelling the man to leave the train, which was running at full speed. Perkins shot five times, and is almost certain that he hit the man once. It was very dark outside, and no further trace of the robber could be followed.

"The train was due at Bainbridge at 1:18 a. m. The people of Bainbridge were aroused and informed of the daring attempt at robbery. The baggageman, Winchester, lives at New Albany, but was taken to Crawfordsville, where he now is. It is thought he will recover. There is no doubt that the robber boarded the train at Greencastle, eight miles south, and as the train was going up grade intended to shoot the baggageman and then hold up the express messenger and take the contents of the safe. The Superintendent telegraphed the agent at Bainbridge to spare no expense and effort to capture the robber. The Sheriff of Putnam County with a posse of men is in search, but there is nothing to report. No marks or blood of any kind can be found."

A Brave Engineer.

The fast mail train from the South, due in Petersburg yesterday morning at 5 o'clock, did not reach there until 9:30 o'clock, in consequence of an accident which occurred about three miles beyond Pleasant Hill. The train left Weldon on time in charge of engineer William McSwain, of Wilmington, N. C., and was traveling at the rapid speed of the "fast mail" until within three miles of Pleasant Hill, when the connecting-rods of the engine broke, throwing the running gear out of order and causing the snapping of bolts, which was followed by a free escape of steam and hot water directly in the face and upon the person of the engineer. His position was not only dangerous but extremely painful, and he was almost blinded by the steam. The engineer, however, did not lose his presence of mind, and, thinking more of the passengers in his charge than of himself, stood bravely to his post. The engine crashed along at unabated speed, and but two miles ahead was a long trestle bridge, which, if reached, would render doubly dangerous the risk of accident. Suffering intensely from the scalds, and his body burning from the effects of the hot water which saturated his clothes, Engineer McSwain was enabled to find the lever and reverse the engine.

His fear then was that an explosion might occur, and to prevent this he worked until he had flooded the furnace and extinguished the fires. The engine was stopped before reaching the bridge and the train and passengers were saved from accident.

The passengers and officials of the road were loud in praise of the heroic conduct of the engineer. An engine was sent to the assistance of the disabled train and it was brought here about four hours late. Engineer McSwain was brought along with it, and was taken to the Albemarle Hotel, where he has received every possible attention.—*Richmond (Va.) Dispatch, Aug. 5.*

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

UNITED STATES RAILROADS IN 1885.

The year covered by the reports in the new issue of Poor's Manual, which will appear in a few days, includes the whole or the larger part of the trunk line railroad war, which was also a period of general depression in business. For though there was renewed activity in the last quarter of last year, and this is reflected in the earnings of those roads whose reports cover that quarter, the bad business of the previous months made many of these unfavorable for the whole year, while a very large number of the reports cover the year ending with September last or an earlier month, including those of some of the most important railroads, as nearly all the New York and New England railroads.

From proof-sheets of the introduction to the Manual we are able to make the following comparisons of last year's railroad business with that of previous years.

The statistics of traffic are not unfavorable, for the low rates that reduced the profits of the railroads tended to increase the traffic, and did enormously increase it on a few lines, and 1884 was a year of light traffic.

The miles of railroad reporting traffic, the numbers of *millions* of passenger and ton-miles, have been, for four years:

	1882.	1883.	1884.	1885.
Miles road	95,752	106,938	113 173	123,110
Millions of				
Passenger-miles	7,483 1	8,541.3	8,778.6	9,133.7
Ton-miles	39,302.2	44,064.9	44,725.2	49,151.9

Thus the *yearly increase* in passenger and ton-miles has been, by these reports:

	Millions of					
	Passenger-miles.			Ton-miles.		
	1883.	1884.	1885.	1883.	1884.	1885
Amount	1,058.2	237.3	355.1	4,762.7	500.3	4,426.7
Per cent	14.1	2.8	4.0	12.1	1.5	9.9

If these were complete for the whole railroad system, or even equally complete for every year, the figures would show very well the growth of railroad traffic in the country. They were, however, much more complete last year than for previous years, as may be seen by the following statement of the percentage of the mileage worked whose operations were reported in each year:

1882.	1883.	1884.	1885.
83.5	88 7	90.4	96.3

So the most that we can say of the growth of traffic last year is that 96 per cent. of the railroad system had 4 per cent. more passenger traffic and 10 per cent. more freight traffic in 1885 than 90 per cent. of the system had in 1884. The traffic *per mile of road* has been:

	1882.	1883.	1884.	1885.
Passenger-miles	78,146	79,876	77,570	74,190
=Each way daily	107	109½	106	101½
Ton-miles	410,418	412,100	395,190	399,250
=Each way daily	548½	564½	541	547

This shows that the density of passenger traffic has decreased and that of freight traffic has been nearly stationary for the four years, on the roads reporting, and makes it probable that the total traffic of the country has increased slowly of late. The reported earnings from passengers have been:

	1882.	1883.	1884.	1885.
Total	$188,137,462	$206,837,256	$206,790,701	$200,883 911
Per mile	1,964	1,841	1,828	1,632
Per pass. tr a in-mile	$1.14	$1.10	$1.00	$0 93½
Per pass-mile	2.514 cts.	2.422 cts.	2.356 cts.	2.200 cts.

Thus the total passenger earnings of the 123,110 miles reporting for last year were 3 per cent. less than of the 113,173 miles reporting in 1884, or the 106,938 in 1883. The decrease in the average rate was largely due to the trunk line war, which affected a very large passenger traffic. The passenger earnings per mile of road in 1885 were 10½ per cent. less than the year before, and 16⅝ per cent. less than in 1882, and the average fare per mile has fallen 6½ per cent. since 1884, and 12½ per cent. since 1882.

The average passenger rate in this country usually falls slowly, and the movement last year was doubtless exceptional, so that there may be a turn in the other direction for 1886.

The freight earnings reported have been:

	1882.	1883.	1884.	1885.
Total	$485,778,341	$544,362,831	$502,869,910	$519,090,992
Per mile	5,073	5,092	4,443	4,221
Per freight train-mile	$1 59	$1.55½	$1 51	$1.50
Per ton-mile	1.236 cts.	1.236 cts.	1.124 cts.	1.057 cts.

The total freight earnings reported last year were thus 3⅛ per cent. more than in 1884, but 4⅛ per cent. less than in 1883, in spite of the increase of 15 per cent. in the mileage worked, and of 11 per cent. in the traffic meanwhile; and the freight earnings per mile in 1885 were 5 per cent. less than the year before and 17 per cent. less than in 1883. The decrease in earnings per freight train-mile has been less than 6 per cent. since 1882, 3⅛ per cent. since 1883, and nothing since 1884, though the average rate per ton per mile has fallen 15 per cent. since 1882 and 1883, and 6 per cent. since 1884. That this decrease in the rate had no greater effect on the earnings per train-mile has been due to the increase in the average freight train load from 129 tons in 1882 and 126 in 1883 to 133¼ in 1884 and 142⅛ tons last year. The average passenger train load has not increased, having been little more than 45 in the first two years and 42½ in the last two.

The tendency of freight rates is downward, and that constantly, but the railroad war made the decrease unusually great last year and the year before, and a further decline this year is hardly to be expected. There will be a decline, however, in the West, which may offset the higher through rates east of Chicago and St. Louis. The average last year was little more than a cent per ton per mile, which is very much less than in any other country in the world, and this though our system includes a great many railroads with very light traffic and necessarily with comparatively high rates.

The earnings from other sources, chiefly from mails and express, have been reported as follows:

1882.	1883.	1884.	1885.
$54,071,507	$55,765,693	$53,645,907	$44,735,516

We refuse to believe that there was a decrease of nearly $9,000,000 in these earnings last year, for they are of the kind which are not affected by railroad wars and grow with mileage. It is more probable that some receipts in the nature of interest on investments were included in the first three years.

The earnings reported from all sources were:

	1882.	1883.	1884.	1885.
Total	$727.987,310	$807,112,780	$763,306,608	$765,310,419
Per mile	7,603	7,548	6,745	6,217

The 123,110 miles of road in 1885 earned very little more than the 113,173 in 1884, and 5 per cent. less than the 106,938 miles in 1883. The earnings per mile last year were 8 per cent. less than in 1884 and 17⅞ per cent. less than in 1883.

Naturally we should expect the increase of traffic and of mileage worked to cause an increase in working expenses, whether earnings increased or not. These expenses have been:

	1882.	1883.	1884.	1885.
Total	$463,168,541	$515,524,192	$496,792,697	$498,821,426
Per mile	4,837	4,822	4,390	4,051
Per train-mile	98½ cts.	89½ cts.	91¾ cts.	89 cts.

Thus the working expenses have been kept down below the level of those of 1883, in spite of the much larger mileage. Without any doubt millions should have been spent for maintenance last year which were not spent, but a good deal has been saved by the larger freight-train load. On the whole, however, expenses were unduly low last year.

This leaves as net earnings:

	1882.	1883.	1884.	1885.
Total	$264,818,769	$291,587,588	$266,513,911	$266,488,993
Per mile	2,766	2,726	2,355	2,166
Per train-mile	56 cts.	54 cts.	49 cts.	47½ cts.

Thus the net earnings last year, from 9 per cent. more road, 4 per cent. more passenger traffic and 10 per cent. more freight traffic, were almost exactly the same as the year before (a trifle less), 8½ per cent. less than in 1883, and only 0.6 per cent. more than in 1882; with the addition of 27,358 miles of railroad since 1882, there has been an increase of only $1,670,224 in net earnings, which is less than one little railroad earns with 265 miles of road.

Nothing shows more clearly how railroad profits have fallen off. The net per mile was $600, or 21⅞ per cent. less last year than in 1882. This is due in the first place to an increase in railroads, much greater in proportion than the increase in production and traffic, but also, and chiefly, to the reduction in the average rates; for with the rate of 1882 the traffic of 1885 would have yielded $163,000,000 more than the actual net earnings in 1885. It is not to be supposed that it would have been possible or that it would have been desirable to maintain the rates of 1882. Certainly a considerable part of the increase in traffic was due to the lower rates; but neither is there any doubt that in 1885 especially the rates were unduly low on a very large amount of traffic, and that reasonable rates would have yielded very much larger net earnings.

Some railroad companies hold vast amounts of the securities of other railroad companies, the interest on which, of course, comes out of the net earnings of the railroads whose securities are held. Having been a part of the income of one ocmpany, it then becomes a part of the income of another, and therefore such income does not swell the aggregate income earned by railroads, though it swells the amount to be divided among stock and bond holders. It is not sufficiently understood that railroad property may be represented by stocks and bonds more than once. The $100,000,000 of other companies' securities held by the Pennsylvania Railroad Company, for instance, count for their face in the accounts of the companies issuing them, and count again for their cost in the accounts of the Pennsylvania Railroad Company. One man may give his note secured by $1,000 worth of property, and the owner of that note may give it as security for his own note, and so on until there are a hundred or a thousand $1,000 notes outstanding, all secured by the same property, and all paid by the payment of the first. The Manual gives a head for "real estate stocks, bonds and other investments"—that is, other than road and equipment—and the $946,353,859 under this head probably consists chiefly of these securities, which must be subtracted from the total capital in order to ascertain the capital represented by the railroad and the amount of it per mile.

If the whole of this sum were chargeable to securities held, it would make a difference of not less than $7,687 of stock and bonds per mile of road, whose interest must be paid from earnings. This is equal to about one-eighth of the total stocks and bonds issued.

Taking the figures as they stand (which cover considerably more mileage than that reporting operations), the reported cost of road and equipment has been:

	1882.	1883.	1884.	1885.
Miles	144,461	140,552	125,152	127,729
Cost	$6,035,090,146	$6,684,756,045	$6,924,754,444	$7,037,627,350
Per mile	52,726	55,461	55,329	55,098

The increase in reported cost since 1882 has been just about $1,000,000,000, or 16⅞ per cent., while the increase in mileage has been 11½ per cent. By far the larger part of this increase was in the first year, and since 1883 the increase in mileage, 6 per cent., has been a little greater than the increase in reported cost, 5¼ per cent., bringing down slightly the average cost per mile. The capital per mile reported is as follows:

	1882.	1883.	1884.	1885.
Stock	$30,674	$30,759	$30,004	$29,867
Bonds	28,268	28,650	29,317	29,453
Other debt	2,352	2,243	1,955	3,840
Total	$61,294	$61,652	$61,336	$63,160

There was thus little change until last year, when probably the overdue and unpaid coupons of the many roads in receivers' hands were included with the other debt, nearly doubling it. These items are likely to be very greatly changed by the reorganizations now in progress, few being finished early enough to be included in this issue of the Manual. There is reason to believe, too, that they will be swelled thereby, as in many reorganizations the stock or debt or both are increased not only by funding coupons, but by paying off the securities with a prior lien at a premium in other securities, often bearing a lower rate of interest. Many issues of income bonds will be made also; and altogether, while the principal per mile of road is likely to be increased by these operations, the obligatory interest is likely to be decreased.

On the other hand, the new railroad recently built or under construction has for the most part very much less than the average capital per mile. It must be remembered that the increase in capital covers not only the new mileage built, but the improvement of old roads, which goes on almost constantly and ab-

sorbs many millions annually, but was probably less last year than in any other since 1879 or 1878.

The total income (net earnings and other income) of the railroads reporting has been:

1882.	1883.	1884.	1885.
$315,663,225	$359,942,327	$348,756,172	$352,881,470

The payments from this for interest on bonds and dividends on stock were:

	1882.	1883.	1884.	1885.
Interest	.....	.....	$167,286,139	$179,681,322
Dividends	$97,159,519	$101,579,038	93,203,835	77,672,105

The interest on bonds was not separately stated until 1884. These interest payments were at the rate of 4.78 per cent. in 1884, and 4.9 per cent. in 1883, on the bonds outstanding at the *beginning* of those years. The dividend payments were sufficient for an average payment of following percentages on all the stock at the *beginning* of the year:

1882.	1883.	1884.	1885.
3.04	2.90	2 51	2.06

The whole amount of dividend payments this year is, indeed, the smallest since 1880, and even then very nearly the same was paid on the stock of 84,225 miles of road as last year on the stock of 123,110 miles. But the decrease from 1884 to 1885, 18 per cent., is when there was very little increase of the capital stock (1½ per cent.).

Besides the payments for interest and dividends, there are large other payments from net income, some of which go for additions to the property or to pay floating debt, when they are virtually income to the stockholders; but doubtless much the larger part of the $86,139,000 reported as expended last year from net income, other than for interest and dividends, was for rent of other roads, which in the accounts of the whole railroad system forms no part of the income on the capital invested, the receipts of the lessors being balanced by the payments of the lessees. Substantially, the whole of it goes to pay interest and dividends for the lessor companies and is counted there. The aggregate payments for interest and dividends last year make 3.44 per cent. on the entire stock and funded and other debt outstanding at the beginning of the year 1885, and this can be but slightly less than the actual total net income. A statement of the average interest earned on the entire capital cannot be accurately made, because the capital is reported every year for a larger system than that which reports net earnings. The nearest approach to it is by dividing the net earnings reported for each year by the capital reported at the close of the previous year, which gives as the percentage of the return:

1882.	1883.	1884.	1885.
4.21	4.15	3.56	3.47

This agrees very closely with the actual payments last year for interest and dividends, which was 3.44 per cent.

There are, of course, many millions of stock outstanding which do not represent capital expended; but there are also many securities which represent property which has cost much more than their face. It must be remembered that the average rate of interest obtainable has been falling, and it is idle to expect railroad securities to escape the general fate of capital. Considering the enormous increase in the railroad system in so short a time, the railroad wars, and the general depression in business, it is remarkable that the profit should have fallen no more than 18 per cent. (from 4.21 to 3.47) since 1882.

THE LATER RESULTS OF THE BRAKE TESTS.

We gave last week a very full summary which practically concluded our reports of what was unquestionably the most creditable and satisfactory series of tests in the history of American railroading. The completeness and full value of the tests will not appear until the official records and diagrams are available, but enough has already appeared to fully justify what we have said of them. The tests are already sufficiently evident.

From first to last the tests have gone on smoothly and promptly according to programme. As this has involved keeping out of the way of regular trains, in a fairly crowded piece of track, and the loading and unloading of 6,000 car-wheels many times, not only to carry out the fixed programme, but to provide for the exigencies of breakdowns and the unreadiness of competitors, it has required careful management to do this, but it has been done.

At the final tests, it is probable that the number of competitors will be far less. Not more than three at most, and possibly not more than two, of the five present competitors are likely to appear again, and although new interest may come from some new brake which may put in an appearance in the mean time, and ask to be tested for what it is worth—a privilege which would probably be granted as a side-issue to the regular competition—the second tests are likely to be much less interesting and important than the first.

In the main, the closing week did much to confirm and strengthen previous indications, but added little really new. The most interesting and important single result was the close-coupling test, elsewhere commented on. This, however, was apart from the brake tests proper: but some of the results, both with air brakes and buffer brakes, were notable.

The conclusion of the tests left it still more evident than before that the buffer brakes in their present form, if not indeed in any form, were quite unfit for general use. The Rote, which has done more of what is expressively called "blowing" than any competitor, failed the most completely of any. It failed to do any perceptible braking whatever, not only in its first preliminary runs, but in its formal trial, after having had three weeks for readjustment with yard engines and track room always at its service; a fiasco which puts a decidedly funny aspect on its remarkable challenges of the Westinghouse, which so frightened that company that it made no response whatever. This second failure was so far discouraging to the company that it took off its brake-gear on the spot and sold it for scrap; whether as a final abandonment of the device or merely because radical changes of the design were contemplated, we cannot say. On some of the front cars it is said the brakes acted efficiently, but on the rear half of the train the shoes were not even moved up to the wheels so as to grow warm.

The Widdifield & Button came out the next worst, it being the only buffer brake which has produced notably injurious shocks, even with trains of 25 cars. We find we did it an injustice, however, in saying that it had never made any trials with trains equipped throughout with its brake. A few trials had been made with very short trains (10 or 12 cars) having no unbraked cars in the rear, and that there were no more is reasonably claimed by the inventor to be not his fault, since he had been unable before these tests to get together many cars for tests. It is but just to remember that difficulties have been brought out at Burlington which no one had exactly foreseen or guarded against. Under the conditions in which the brake had been tested, it had proved to be quite capable of doing fairly good work, justifying the hopes which both the inventor and practical railroad men have formed of it. The difficulty was that the previous tests had not covered a sufficiently wide range for the requirements of practice.

Of the American brake the worst which could be said with any justice is that all is lost save honor. This company also had not tested 50-car trains, and difficulties arose which it was quite unprepared for; but much of its record was very creditable, and had it been able to do as well with 50 cars as it did with 25, it might well have crowded all competitors hard. The "service drop down hill," described last week, was certainly a dreadful performance. The train was simply beyond control, and put its brakes on and off by its own undulations alone, without any brakes set at the head of the train, thus demonstrating that it could not even have been hauled over the road for any distance without making any stops at all. It is this which gives the worst complication to its record. Could it be cured by merely cutting out a third or half of the cars, it might be borne; but while this might and no doubt will ameliorate matters, there is no reason to believe that it will entirely cure it, and if the cutting out were done by leaving every second, third or fifth car only with brakes on, or by having say ten cars at the head and ten cars at the rear only with brakes on, there is strong reason to believe that the action would be very much the same, possibly not even milder.

These are the conditions of practice, and must be met. It would never do to have the careless making up of trains, or a neglect to cut out a sufficient number of cars, endanger such performances as that referred to, even if it does not go on in a small way in spite of all precautions, as there is reason to fear it may.

The radical difficulty with the buffer brakes, as we have noted, appears to be that their going on creates a force which tends to take them off, and *vice versa*. The remaining loop-hole for hope therefore is, (1) to use only so much of the great pressure caused by the first impact as is desirable; (2) to hold this pressure throughout the stop regardless of the draw-bar motions; (3) to release in some simply way at the end of the stop, as heretofore. We understand the American company is not without hopes of accomplishing these ends, and we sincerely hope it may do so, for it came to the tests without any preliminary loud flourish of trumpets and with a device which showed in practical test many meritorious features, justifying reasonable men for believing in it.

Allowing all other difficulties to be overcome, the lack of automatic action when trains break in two must ever be a serious drawback to the buffer brakes, unless overcome. In their present form they are practically out of the game, but the American steam driver brake made a very fine record.

The closing week also told some new tales of the continuous brakes, as notably that their action seems to be quite as good with the rear 20 of 50 cars cut off as when applied to them all, indicating a defect which is worth correcting, if possible, because none of the other difficulties which had been anticipated in working such long trains have actually arisen. The application, release and supply of air have all proved to be perfectly simple matters, causing no difficulty—a fact which puts in a curious light a statement which we learn was made by a general officer of an important line only a few weeks since, that he "had tried it," and knew that the air brake was not practicable even on 30 cars. No doubt he thought he had tried it, and made the statement in good faith. Equally erroneous statements are often made in good faith at railroad and other conventions, as almost every one has observed. One man will rise up in meeting and say in a solemn way that "his experience" about something is thus and so. Another man will follow him and say that "his experience," under substantially the same conditions, is just the contrary. Which is bearing false testimony? Probably neither, in the sense that he has not seen some evidence to substantiate his views. Possibly both, in the sense that they have not taken proper care to look into all the facts before forming conclusions. All those who have taken part in really careful tests know the immense difficulty of eliminating all side issues so that the apparent result shall be a true one. Without doing this, tests, like figures, are more likely to lie than not.

Not one of the competitors in the recent tests has made what can fairly be called very quick stops, as measured by the best performances on record. The famous Galton-Westinghouse passenger tests in England (see *Railroad Gazette*, May 22–29, 1885) showed far quicker stops in proportion, as we shall show more fully later.

For this the condition of the brake-shoes was probably largely to blame. The most extreme precautions were taken in England to have the fit of the brake-shoes perfect. No precautions at all appear to have been taken in this respect at Burlington by any of the competitors, while we have noted that three out of five of them did not even take care to have the brake pressure equalized on the two brake-beams.

The Westinghouse was in the best shape in both these respects, and its stops probably fairly represent what is attainable in regular service. The others do not even do that, their brake-shoes having been new and some of them in most wretched condition, so that allowances will have to be made. We are having photographs of the brake-shoes made for engraving, to show their actual condition, and in other respects shall endeavor to eliminate accidental and meaningless causes of variation from our final reports.

For one reason or another no one of the test trains is in condition to enter the "endurance test" of nine months (till April, 1887) which has been heretofore proposed, and what arrangement in substitution therefor will be made is as yet doubtful. Only two of the competitors, the Eames and the Westinghouse, passed all the general tests, and therefore were entitled to enter the endurance test, unless by courtesy of the committee.

The Heavy Western Wheat Movement.

The winter wheat movement to the Northwestern markets is now about equal to the largest ever known. The receipts at each of the markets where considerable quantities of winter wheat are received, have been for five weeks:

	Week ending—				
St. Louis:	July 3.	July 10.	July 17.	July 24.	July 31.
1886	110,405	734,246	1,2[illegible]3,489	1,371,746	1,047,957
1885	89,860	126,686	161,977	318,837	373,900
1884	.....	286,991	491,189	480,771	764,896
1883	119,957	298,146	540,946	704,691	
Toledo:					
1886	22,785	40,392	358,957	1,169,169	1,336,830
1885	49,903	61,009	32,080	70,913	258,556
1884	.....	65,804	74,786	325,155	682,199
1883	.....	74,829	44,979	133,702	411,136
Detroit:					
1886	36,391	50,870	191,028	522,506	717,728
1885	79,052	75,395	28,066	45,785	98,919
1884	.....	19,903	31,720	61,694	123,328
1883	.....	18,925	18,931	16,157	28,120
Chicago:					
1886	77,602	102,313	241,683	505,551	619,997
1885	190,526	321,486	284,204	204,311	213,508
1884	.....	96,893	97,026	147,496	287,077
1883	.....	126,767	124,436	127,760	249,336

Thus, at all these places the receipts have grown immensely from the first to the last part of the month, and at every one have been much larger this year than in any other of the four. The total receipts in each of these years have been for the four July weeks:

Year.	St. Louis.	Toledo.	Detroit.	Chicago.	The four.
1886	4,417,438	2,905,348	1,482,132	1,469,544	10,274,462
1885	981,350	422,558	248,165	1,085,509	2,737,582
1884	2,017,847	1,148,004	236,645	629,092	4,031,588
1883	1,063,740	664,646	82,133	628,299	3,038,81[illegible]

The course of the receipts this year has been the usual one. The new crop is first felt at St. Louis, next at Toledo, and then at Detroit and Chicago; but the movement this year has been heavy without precedent, and as we see, these four winter wheat markets this year received 270 per cent. more than last year, 155 per cent. more than in 1884, and 237 per cent. more than in 1883.

This is a very great change, but it is possible that the total wheat movement is somewhat exaggerated by it. Receipts at St Louis are supposed to include all going through it as well as to it, and receipts at Chicago all going through it except what may have been before reported as received at Milwaukee or Peoria; but receipts at Detroit and Toledo include only what is consigned to those places, otherwise a very large part of the receipts at Chicago, Milwaukee, Peoria and St. Louis would be counted twice. Of late years not much has been consigned to Toledo, which formerly stood next to Chicago in grain receipts. This has been because rail rates are so low that it does not pay to transfer to lake vessels for the short haul to Buffalo. The same is true of Detroit except that a little later in the season it is likely to have consigned to it a large part of the surplus wheat of Michigan. This year, however, there has been great complaint of "short-billing"—shipping to such places as Detroit and Toledo at less than the proper proportion of the through rates, and there billing again at the regular rate. It may be that the grain so consigned has been reported as Toledo and Detroit receipts, which ordinarily would not be so reported, and that a good deal of it had already been reported with the St. Louis receipts, though we should not expect such consignments to be reported. There is no doubt, however, that the country between St. Louis and Toledo has a great deal of wheat to ship this year, and had scarcely any to spare last year. A great gain over last year is natural, but in several other years the crop in this country was quite as large as this year, or larger, and the large gain over them is not so easy to understand.

That it is winter wheat which has caused the recent heavy wheat movement may be seen by comparison with the following:

The average weekly wheat receipts in June and the total receipts in each week of July have been as follows at the eight reporting Northwestern markets—St. Louis, Peoria, Chicago, Milwaukee, Duluth, Detroit, Toledo and Cleveland—for eight years, in bushels:

Year.	Av. in June.	Week ending July 10.	July 17.	July 24.	July 31.
1879	1,324,148	1 734,275	2,013,533	2,455,596	2,732,407
1880	922,424	913,508	2,281,240	3,209,537	3,456,718
1881	1,562,112	1,044,166	1,135,423	1,198,660	1,711,001
1882	627,578	848,580	1,595,224	3,101,184	3,686 177
1883	857,996	462,833	613,570	938,932	1,546,574
1884	686,608	757,021	985,743	1,385,641	2,112,715
1885	1,052,272	925,408	882,909	1,133,400	1,379,572
1886	806,700	1,303,303	2,389,742	3 967,079	4,065,814

Thus the wheat receipts were never before so large so early in the year as they were in the last week of July this year, and the total wheat receipts in July (four weeks) were also larger this year than in any other, having been:

Year.	Bushels.	Year.	Bushels.
1879	8,935,811	1883	3,561,909
1880	9,861,003	1884	5,244,120
1881	5,089,250	1885	4,320 389
1882	9,531,065	1886	11,725,938

Thus the wheat receipts last July were not only nearly three times as great as last year, more than twice as great as the year before, and more than three times as great as in 1883, but they were also much greater in the earlier years of very heavy movement, and must have had a very great effect on the traffic and earnings of many railroads.

The wheat receipts at the four markets not included in the winter wheat markets have been:

1883.	1884.	1885.	1886.
523,091	1,212,532	2,582,807	1,451,476

The great receipts this year have been at St. Louis, Toledo and Detroit, and the railroads that have profited most by the movement must have been those which carry to those places. The Detroit and Toledo receipts must have been chiefly by the Wabash, and they account for its great increase in earnings in the last week in July (from $271,740 last year to $392,278 this—44 per cent.); in which the wheat receipts of Detroit and Toledo were 2,054,558 bushels, against 357,475 last year. All the lines south of the latitude of Bloomington in Illinois, Indiana and Ohio ought to profit more or less by this heavy wheat movement; but the indications are that those which do not carry to the lakes have not profited by it nearly as much as those that do, for the receipts of wheat at Atlantic ports, though they have increased largely, have not increased like the Northwestern receipts. For the four weeks they have been:

1881.	1882.	1883.	1884.	1885.	1886.
10,076,987	12.011,510	4,496,687	9,796,050	3,904,218	6,337,047

The increase over last year is 2,433,000 bushels (62 per cent.), while the increase in the Northwestern receipts has been 7,405,000 bushels (171 per cent.). Moreover, while the Northwestern receipts were much larger this year than ever before, the Atlantic receipts were exceeded in every year since 1877 at least, except last year and 1883. In 1879 the Atlantic receipts in a single week—the last week of July—were 6,042,000 bushels, which is little less than the receipts of the four weeks this year. This is further evidence that the heavy movement in the Northwest last July was peculiar. Atlantic receipts are likely to be one week behind the Northwestern receipts, and sometimes much more: but the difference now is likely to be due to the fact that the interior stations east of St. Louis and south of the lakes, which usually ship their wheat directly to the seaboard (where it is first reported in the Atlantic receipts), or to interior points in the East (where it is not reported at all), last July shipped to Toledo and Detroit to an extent heretofore unknown, and it is probable that they did this because of some advantage in rates for transportation.

The new winter wheat crop is usually felt first on the Atlantic coast at Baltimore, and then at Philadelphia. There being little to ship last year, these places received little, but they show the effect of the good crop very clearly this year. The receipts in successive weeks have been:

	Week ending July 3.	July 10.	July 17.	July 24.	July 31.
New York	244.550	651,150	1,028 1 0	870,882	670,696
Baltimore	32,777	80,856	399,524	512,484	647,491
Philadelphia	17.105	7,921	70,903	354,704	475,328
Total at ports	486,405	915,237	1,588,621	1,895,753	1,937,426

The new crop probably had little or nothing to do with the large receipts at New York in the week to July 17, and as its average weekly receipts in June were 1,180,000 bushels, it can hardly be said to have shown any effect in July from the new crop as yet, and though the fact that it has gone so largely to Toledo Detroit is almost sure to bring it to New York when it does go to the seaboard. Baltimore, however, received about 49,000 bushels a week in June, and Philadelphia 47,000, and it must be the new crop which has increased their receipts, which are likely to be largest at this time of year.

While the Northwestern wheat receipts were so exceptionally large last July, the total grain movement in that month was not so remarkably great, the Northwestern receipts of grain of all kinds having been, in bushels, for the four weeks:

Year.	Bushels.	Year.	Bushels.
1878	15,221,600	1883	13,904,583
1879	17,261,416	1884	14,404,568
1880	27,519,355	1885	15,638,461
1881	22.0:7,491	1886	23 882,776
1882	17,752,526		

The receipts this year were larger than in any other except 1880, and 53 per cent. more than last year, while the wheat receipts were, as we have seen, 171 per cent. greater. Still there was some increase over last year in other grains, the receipts of which were 12,157,000 bushels this year, 11,318,000 last year, and not as much as that in any other year since 1881.

July Earnings.

The reports of July earnings which have come in during the past week are quite as favorable as those presented a week ago, of the 33 roads reporting this week only three showing any decrease in earnings, 13 gaining more than 20 per cent. and five more than 30 per cent. compared with last year, and the average gain of the 33 being no less than 13¼ per cent. The 43 railroads whose July earnings have been reported so far this year had in the aggregate:

	1886.	1885.	Increase.	P. c.
Earnings	$18,555,579	$16,379,125	$2.176,454	13¼

This is truly a great gain, and much more than balances the losses of a year ago. Then the 83 railroads reporting for July earned 2.8 per cent. less than in 1884, and in 1884 74 roads earned 2 2 per cent. less than in 1883.

The earnings of some of these roads for five years have been:

	1882.	1883.	1884.	1885.	1886.
Can. Pac.	$281,263	$548,886	$549,367	$907,638	$990,000
North. Pac.	694,.67	750,223	1,022,488	1,'08,011	1,120,965
St. P., M. & M.	857,789	823,727	905,156	55 ,387	570,084
St. P. & Duluth	93,699	137,924	119,500	144,239	133,679
Total	$1,929,809	$2,160,754	$2,296,461	$2,604,270	$2,814,608

The Canadian Pacific's gain this year is smaller than usual, and the St. Paul & Duluth has a decrease of 8½ per cent., which is what might be expected from the rates to the lakes which have been made on flour, the chief traffic. The Manitoba has a small gain, but in most previous months of this year it has earned less than last year. It is still behind the other three years. The Northern Pacific alone has a large gain (12 per cent.), and it earned more than in any other July.

These four roads are in the part of the country which, for some time, was growing fastest, and all the railroads except the St. Paul & Duluth have had great additions to their mileage since 1882 and some since last year. Their aggregate gain over last year is 8 per cent., or considerably below that of the other roads reporting, and their gain since 1883 has been but moderate, considering the great additions to them meanwhile.

Northwest and west of Chicago the principal roads have earned for five years:

	1882.	1883.	1884.	1885.	1886.
C., St. P., M. & O.	$389,459	$444,333	$466,760	$468,800	$486,600
C. & N. W.	2,059,952	2,160,631	1,976,177	2,036,800	2,127,700
C., M. & St. P.	1,464,927	1,829,285	1,949,545	1,893,676	2,035,000
Cen. Iowa	90,229	107,874	97,212	80,693	99,014
Ill. Cen. in Iowa	140,052	154,578	127,718	134,111	128,504
Marq., H. & O.	177,828	138,823	140,633	129,.993	139,513
Mil. & Nor.	..	..	37,805	42,950	46,808	51,988
Mil., L. S. & W.	73,156	88,229	96,898	112,818	238,716
Chic. & Alton	702,635	731,503	730,944	668,393	714,803
St. L. & S. F.	330,914	270,101	359,111	326,078	407,818
Total	$5,405,152	$5,963,272	$5,987,048	$5,898,470	$6,421,686

Several of these were given in our list last week. All but one gain over last year; but there are only two large gains, and the whole group, on an average, has an increase of 9 per cent. over last year, which is also considerably below the average gain of all the roads reporting.

These two groups in the West had about half the earnings of the whole 43 roads that have reported for July, but while their increase over last year is $743,554, or 8¾ per cent., the gain of the other 29 roads was $1,432,000, or 18.2 per cent.

Of these roads four are west of the Missouri River and three are in the South; the latter have made large gains, but the western roads have not. Then there remains 22 railroads east of Chicago and St. Louis whose aggregate earnings were:

	1886.	1885.	Increase.	P. c.
Earnings	$6,440,305	$5,389,895	$1,050,410	19.5

That is, these roads, which are in the field of trunk line rates, have made a very large gain over last year, and a greater one than the railroads in any other part of the country, though it is precisely these lines which have added least to their mileage. Earnings for five years in this territory have been:

	1882.	1883.	1884.	1885.	1886.
Ill. Cen.:					
Ill. & S. Div	$837,981	$772,792	$704,233	$723,007	$809,248
C. & E. Ill.	151,763	120,693	128,392	114,064	137,834
Ev. & T. H.	.....	59,331	73,422	66,643	83,825
P., D. & Ev.	73,740	45,820	54,783	52,531	71,992
Ind., B. & W.	215,977	217,618	173,188	167,665	218,239
Ohio & Miss	364,117	300,650	282,202	281,799	347,156
L., Ev. & St. L.	.....	48,000	56,000	69,400	84,012
Cin., I., St. L. & C.	217,198	190,123	209,515	177,087	212,200
Chic. & W. Mich.	111,949	120,125	123,883	106,966	125,200
Det., L. & N.	122,894	121,355	97,903	93,592	107 612
F. & P. M.	148,503	184,427	172,853	178,594	154,849
Wabash	1 418,837	1,216,409	1,234 298	838,099	1,057.351
L. Southern Cin., Wash. & B.	27,494	29,255	35,356	25,054	34,906
	159.743	146,923	141,733	119,140	150,820
Grand Trk	1,241,870	1,411,712	1,625,156	1,467,177	1,680,976

Two things especially have served to swell the earnings of the roads in this territory, first, the restoration of through trunk line rates, and second, a very heavy wheat movement in place of the very light one last year; but greater general industrial activity has had much to do with the great and general gain.

The three Southern roads have earned:

	1882.	1883.	1884	1885.	1886.
Norfolk & W.	$191,535	$219.188	$185,824	$187 397	$237,256
Louis. & Nash	1,083 765	1,124,776	1,060,104	1,057,332	1,241.995
Gulf, C. & S. F.	107,992	163,452	126,432	139,430	192,000

Thus these all earned more this year than ever before in July, while their gains over last year were very large.

For most of the railroads east of Chicago and St. Louis, to do better than last year is not necessarily doing well, but we see that not a few have done better than in most previous years. Of those whose earnings are likely to have been much affected by the through rates, the Cincinnati, Washington & Baltimore gained 26½ per cent.; the Grand Trunk 19½; the Indiana, Bloomington & Western 30; the Ohio & Mississippi 23, and the Wabash 26.

All this argues great gains by many important railroads which do not report, and the best July business since 1883 at least.

The through shipments of freight to the West from New York in July by the trunk lines have been, in tons:

1880.	1881.	1882.	1883	1884.	1885.	1886
78.193	73,114	79,464	81,959	92,722	102.397	86,728

Thus the July shipments this year were the smallest since 1883, and were 15½ per cent. less than last year, when the low rates attracted the freight which usually goes by canal. This year it is said that the shipments by canal are unusually large, including considerable high-class freights—dry goods and groceries—which have usually gone by rail, whatever the rates might be. As the decrease in shipments since 1884 (the only year when rates were maintained that the rail shipments were larger than this year) is only 5,984 tons, it is quite possible that the total rail and canal shipments from New York were as large this year as ever before.

Railroad Legislation in the Last Congress.

The chief legislation affecting railroads at the late session of Congress was as follows: The unearned land grant of the Atlantic & Pacific Railroad was declared forfeited. The original grant gave 25,600 acres per mile in the territories and 12,800 in the states for a railroad to be built from the

west line of Missouri to the Pacific Ocean. The law making this grant was passed about 1866, and under it 34 miles of road were completed in 1873 from the terminus of what is now the St. Louis & San Francisco Railroad on the line between Missouri and the Indian Territory westward to a junction with the Missouri, Kansas & Texas Railway at Vinita, which in 1882 and 1883 was extended 68 miles further to Red Fork. The portion of the line in the Indian Territory was to be entitled to the land only in case the territory should be opened to settlement. The line would pass through the whole length of the territory from east to west, about 330 miles, and if it had been open to settlement, this part of the road would doubtless have been built long ago; for the land is about as good as in Kansas, and the country would have afforded a large traffic and the land grant have been very valuable. But with settlers excluded, it could afford next to no traffic, and the land grant was contingent and unavailable; so the construction of the road as a transcontinental line was begun 380 miles west of the western border of that territory, the Atchison, Topeka & Santa Fe serving as its eastern outlet. But this was not built to the Pacific Ocean, but only to the Colorado River, 560 miles, and it is this part of the road only, in New Mexico and Arizona, that has received its land grant.

Of the 600 miles further east, only 215, in New Mexico, would certainly have received land if the road had been built; about 165 is across the pan-handle of Texas, where the land is state and not national property, and something more than 220 miles unbuilt is in Indian Territory, where no one can own land now. Besides there is the great distance across California where the company could have built and claimed land, which it did not intend to do, having contracted with the Southern Pacific for the outlet which it is now using. Indeed, it is not probable that the company would desire to build any more road unless the Indian Territory should be opened.

Grants of land in Alabama and Mississippi to various companies which have never built any road were also declared forfeited. Most of these grants were very old.

More important than any bills that passed were some which got through one house and failed in the other. Among these were bills forfeiting parts of the land grant to the Northern Pacific. The Senate passed one forfeiting it for all the road not now completed, including about 200 miles down the Columbia River, which the company does not intend to build, the Oregon Railway & Navigation Company's line occupying the route, but also 75 miles of the Cascade Division, which is all under contract. The House, however, substituted for this a bill forfeiting the grant for all road built since 1879—that is, nearly all west of the Missouri River, most of which is in the possession of the company, while a good deal has been sold by it. Neither got through both houses.

The bill providing for the payment of the Pacific railroads' debt to the government attracted much attention and considerable favor in diverse quarters, but it did not even reach a vote in the Senate, where it originated. Neither did the proposition for aid to the Eads Ship Railroad across the Isthmus of Tehuantepec reach a vote, though it was once favorably reported by a committee.

The most important of all proposed railroad legislation fared like the bill to forfeit the Northern Pacific land grant: the Senate passed the Cullom bill for the regulation of interstate railroad transportation, and the House substituted for it the Reagan bill, which has got through one house or the other two or three times within the past ten years, and between these two stools the attempt at national railroad regulation fell.

A great many bills were passed authorizing the construction of bridges—mostly railroad bridges—across navigable streams; among them for five across the Mississippi and nine across the Missouri. The Mississippi bridges are to be at Alton, Keithsburg, Dubuque and Red Wing, and Winona; the Missouri bridges at St. Charles, Saline City, Kansas City (two), Atchison, St. Joseph, Council Bluffs, Chamberlain and Pierre. The most important of these bridge charters, however, was that for the Baltimore & Ohio's bridge over Staten Island Sound.

Union Pacific Earnings.

The Union Pacific shows a remarkable increase of earnings in June, considering the unprofitableness of the transcontinental traffic. Its earnings and expenses in June for seven years have been:

Year.	Gross earn.	Expenses.	Net earn.
1880	$2,547,202	$833,902	$1,713,300
1881	2,811,646	1,453,528	1,358,118
1882	2,458,812	1,110 216	1,348,596
1883	2,273,598	1,168,672	1,104,926
1884	1,739,453	1,220 575	518 878
1885	1,955,395	1,454,915	400,480
1886	2,263,821	1,734,524	529,297

The earnings in June, 1884, were reduced $444,386 when Mr. Adams became President, to balance what were considered improper credits to earnings during the entire six months, so that the figures for that year are unduly small, though the actual earnings were doubtless smaller then than in any other ear. This year the gross earnings, though much larger than for the two years next preceding, were less than in the other four years, the working expenses much larger than ever before, and the net earnings, though 32 per cent. more than last year, very little more than in 1884, and not half as great as in any of the four years from 1880 to 1883, and not one-third as great as in 1880. The gains this year over last are:

	Gross earn.	Expenses.	Net earn.
Amount	$308,426	$179,609	$128,817
Per cent	15.7	11.5	32.1

For the half-year ending with June, the earnings and expenses of the Union Pacific system have been:

Year.	Gross earnings.	Expenses.	Net earn.
1880	$11,457,254	$5,677,904	$5,779,350
1881	12,536,560	7,292,719	5,243,841
1882	13,396,984	7,435,140	5,961,844
1883	12,969,723	6,843,670	6,1 6,053
1884	10,993,817	7,634,093	3,359,724
1885	11,224,329	7,949,842	3,274,687
1886	11,606,088	8,444,765	3,161,323

The gross earnings this year were 3.4 per cent. more than last year and 5.5 per cent. more than in 1884; but the working expenses have increased so much that the net earnings this year were 8½ per cent. *less* than last year and 6 per cent. less than in 1884. The increase in net earnings in June, however, was greater than the decrease for the entire six months.

Rarely has there been any parallel to the great decrease in the net earnings of this company since 1883. The decrease in gross earnings (for the half-year) since that time has been $1,363,625 (10½ per cent.), while the decrease in net earnings has been $2,964,739 (48½ per cent.). In 1880 the gross earnings were nearly the same as this year (a trifle less), while the net earnings were $2,618,000 (83 per cent.) greater. This tremendous decrease in net earnings is due to a great reduction in the rates received. The traffic has very largely increased, and the length of road itself has increased 58 per cent. (from 2,854 to 4,519 miles), which has made a great increase in the working expenses unavoidable; but the larger system has been unable to earn more than the smaller one, the contributions of new lines and the growth of traffic on old ones having been offset by the great reductions in rates.

One of the most significant indications of the condition of business is the amount of buildings in progress. This fluctuates greatly from year to year, but not so much as railroad construction, though usually with it. *Bradstreet's* reports the values of buildings constructed in two leading cities (not including Philadelphia, Baltimore, Brooklyn, Cincinnati, Milwaukee and St. Louis) during the first half of the year to have been as follows:

1882.	1883.	1884.	1885.	1886.
$100,935,000	$101,150,000	$100,518,000	$53,385,000	$67,714,000

Thus though the expenditure this year has been 27 per cent. more than last year, it was one-third less than in any of the other three years, and has evidently not kept pace with the expenditures for new railroad construction.

That low rates from Minneapolis and St. Paul to Lake Michigan are likely to be permanent hereafter is indicated by the fact that when recently the railroads united in fixing rates and in advancing them from the level to which they had fallen during their disagreement, the agreed rate on flour consigned directly to the seaboard *via* Chicago or Milwaukee was made 7¼ cents per 100 lbs., which is at the rate of about 19 cents from Chicago to New York; and the local rate to Chicago was made only 10 cents.

The Chicago lumber traffic in the first half of this year was greater than last year, but less than in any of the three years previous, having been in *thousands* of feet:

	1882.	1883.	1884.	1885.	1886.
Receipts	475,011	567,388	685,269	513,520	538,051
Sales and shipments	864,388	792,026	818,325	729,909	767,539
Stocks, June 30	443,040	430,375	470,292	418,132	405,795

There has been an unusual demand for the long and heavy timbers used in railroad construction, and there is reason to believe that the general increase in sales has been greater in proportion than the increase at Chicago, which is 5 per cent. over last year. Compared with 1884 there is a decrease of 6 per cent. in the quantity marketed at Chicago.

The Boston & Albany Railroad's reports for the quarter ending June 30 show:

	1884.	1885.	1886.
Gross earn	$1,910,423	$1,853,666	$2,020,596
Expenses	1,394,966	1,416,727	1,523,339
Net earn	$515,457	$416 939	$497.257
Int. rents and taxes	187,971	188.071	187,786
Surplus	$327,486	$228,868	$309,471

The whole through business was carried at cost or less last year and the east-bound freight also in 1884, so that with the same traffic the road should have earned more this year than in either of those. Actually the gross earnings were 10 per cent. more than last year and 6 per cent. more than in 1884. There was also a large increase in working expenses, however, they being 8 per cent. more than last year and 9 per cent. more than in 1884; this leaves the net earnings a little less than in 1884, but a fifth more than last year, and, the fixed charges remaining the same, the surplus, which is the stockholders' income, was a third more than last year. No other New England railroad is so much affected by the changes in through rates, unless it may be the Fitchburg; but the New York & New Haven's increase in gross earnings this year was greater, proportionately, than the Boston & Albany's.

The latter's expenses were 75.4 per cent. of its earnings this year, against 77.3 last year and 78 per cent. in 1884. Few prosperous railroads require so large a part of their earnings for working expenses; but this is the natural course of things when traffic grows and capital does not. That is, a smaller and smaller part of the earnings is required to pay interest and dividends.

The Mexican Central Railway does not make progress in earnings, these having been for the six months ending with June slightly (2½ per cent.) less than last year. There was a large decrease in net earnings meanwhile, from $883,999 to $586,397—27 per cent.; but the large increase in working expenses (16 per cent.) which caused this should not surprise any who examined the report for 1885 and noticed how very small the expenditures for maintenance were, a fact to which we called attention in reviewing the report. The expenses were 68 per cent. of the earnings in the first half of this year, and only 53 per cent. last year. Last year 54.7 per cent. of the earnings of the whole year were made in this first half of it.

Per mile of road worked the gross earnings were $1,473 and the net $472 in the first half of this year, in Mexican *silver* (like all the other figures), which is now worth less than 80 cents in our currency, in which the interest on the company's debt is payable, so that the $472 (Mexican) net earnings per mile will pay less than $380 (American) of interest. At the reduced rate of 4 per cent. the first mortgage interest is about $550 per mile for the half year, besides which there is interest due on funded coupon notes and debentures secured by collateral, so that the company seems not yet to have adjusted its obligations to its means of payment. The July 4 per cent. coupons were paid half in cash and half in first-mortgage bonds.

The results of the working of the New York, Chicago & St. Louis Railway in the quarter to June 30 have been for three years:

	1884.	1885.	1886.
Gross earnings	$737,385	$683,964	$784,671
Expenses	562.835	544.782	552.197
Net earnings	$174.550	$139,182	$232 474
Interest, rents and taxes paid	45,0 0	104,779	107,125
Balance	$129,550	$34,403	$125,349

Thus there is not only a gain in gross earnings of nearly 15 per cent. over last year, but of 6.4 per cent. over 1884; and unlike most other roads which have had large gains in earnings this year, the increase in expenses is very small. The increase in net earnings is 45 per cent. over last year, and 33½ per cent. over 1884, yet the net earnings this year were at the rate of only $445 per mile, the road having a really large through freight traffic—which will not pay a very heavy rate of interest on the company's debt of nearly $50,000 per mile, now in course of re-adjustment.

The showing for the half year ending with June is a little better, however, the net earnings having been $566,927 this year, or $1,084 per mile. The earnings, etc., for the half year have been:

Year.	Gross earn.	Expenses.	Net earn.	Charges paid.	Surplus or Deficit.
1884	$1,542,272	$1,138,164	$404 108	$404,479	Def. $371
1885	1,509,155	1,126,219	382,936	527,138	Def. 144,202
1886	1,732,834	1,165,907	566,927	219,457	Surp. 357,470

The surplus this year (no interest having been paid unless on receivers' certificates) would pay interest at the rate of 4¾ per cent. on the first mortgage bonds.

The New York, New Haven & Hartford Railroad reports a surprising gain in gross earnings in the April–June quarter of this year, for an old road like it, with a vast passenger traffic and all its business not greatly affected by the great fluctuations of through rates, which the trunk lines feel most. For three years the results in this quarter have been:

	1884.	1885.	1886.
Gross earnings	$1,706.487	$1,664.363	$1 859,826
Expenses	1,078,329	1 011,008	1,201,447
Net earnings	$628,158	$653,355	$658,379
Other income	4,685	4,630	.....
Fixed charges and taxes	237,874	204,948	204,947
Surplus	$394,969	$453,037	$453,432

Thus the gross earnings this year were $195,463 (11¾ per cent.) more than last year. The working expenses, however, were larger by nearly the same amount (18¾ per cent.), so that there is no change in the net earnings.

Compared with 1884 there is an increase of 9 per cent. in gross earnings, 11½ per cent. in expenses, and of nearly 5 per cent. in net earnings—moderate changes except in expenses.

One of the great flour manufacturers of Minneapolis recently has chartered vessels on the lakes, and then with the very low rates to the lakes—2½ to 5 cents to Duluth, and 5 to 7½ to Milwaukee or Chicago—has been able to make his own rates to Buffalo. It is also reported that he has engaged canal boats to take his flour to New York, which is a revival of a practice which has been dead for years. Formerly the canal boats carried flour as well as grain, but there have been next to no receipts at New York by canal since 1880, and then only 21,127 barrels. It is remarkable that a trial of should be made again now, when canal rates are higher than in other years since tolls were reduced.

The Burlington brake tests being completed on Aug. 3 and the results being somewhat unexpected, the rules governing the endurance tests, and the final tests to be held in April, 1887, will probably require some modifications. The Committee of the Master Car-Builders' Association on Freight Train brakes and the brake representatives will probably hold a joint meeting to consider the matter. The meeting will be held in New York about the middle of December.

The Addison & Northern Pennsylvania Railroad Company has brought out a new idea in its latest time-table. This is a small map of the road, printed in light-colored ink directly over the centre of the time-table. The plan is a very good one, the map showing plainly, while the ink in which it is printed is not dark enough to hide the black figures of the time-card. One can thus consult map and train time at the same time, without the trouble of handling two separate sheets or turning the table over, as would be the case were the map on the back of the sheet. This plan is original with Mr. Frank M. Baker, General Superintendent of the road, and is an excellent idea.

Mr. Jeans, in his address on "Railway Extension in the Colonies," chanced to mention the narrow-gauge lines north of Toronto as examples of an attempt to provide for traffic by very cheap lines; the London *Times*, which was one of the warmest partisans of narrow-gauge railroads when the late Mr. Fairlie began to advocate them, having published

his famous paper, "The Railway of the Future," seizes upon this as evidence of the importance of the narrow-gauge. Evidently neither Mr. Jeans nor the *Times* was aware that these railroads some time ago were changed from the narrow gauge to the standard, and will hardly serve to illustrate the advantages of the narrow gauge.

We have received letters on the "Mechanical Conundrum" from several correspondents, but are obliged to defer publishing them this week, owing to the great pressure on our space. Next week, however, we hope to publish a very clear and fully illustrated communication on the matter.

An American journal complains that a visitor to the various exhibitions now being held in England has considerable difficulty in getting any full explanation of the various articles exhibited, and is not allowed to see more than the outside of anything. A locomotive shown at the Liverpool Exhibition is particularly mentioned. The present writer can only say that when he visited the Inventions Exhibition in London last year, he was treated with the greatest kindness and courtesy on all sides, and information was as easily obtained and as freely given as at the Chicago and New Orleans exhibitions. As regards the locomotive exhibited, the writer was not only allowed to see the inside of the smoke-box, but had a long ride on the engine, while the Superintendent of Motive Power, Mr. Webb, personally showed him through the works, where the engines were both under construction and being repaired. The consumption and mileage sheets were also freely shown, and disposition was evinced to give every attention to a visitor from this side the Atlantic.

The truth is that in these matters a little tact and patience will enable any one to get at information he wants in any part of the world, while a disposition to carp at everything, and resolutely shut one's eyes to any merit will insure a visitor a cold reception either side the Atlantic.

Record of New Railroad Construction.

Information of the laying of track on new railroad lines given in the current number of the *Railroad Gazette* as follows:

Atchison, Topeka & Santa Fe.—The *Chanute Branch* is extended from Chanute, Kan., southwest to the Verdigris River, 17½ miles.

Carolina Central.—Extended from First Broad River, N. C., west to Busby Creek, 4 miles.

Chesapeake & Nashville.—Track laid from Gallatin, Tenn., northeast 11 miles.

Chicago, Burlington & Northern.—An addition of 16¼ miles is reported, completing the main line.

This is a total of 49 miles on 4 lines, making in all 2,311 miles thus far reported for the current year. The new track reported to the corresponding date for 15 years has been:

	Miles.		Miles.		Miles.
1886	2,311	1881	3,180	1876	1,231
1885	1,377	1880	2,704	1875	607
1884	1,905	1879	1,346	1874	916
1883	2,942	1878	1,005	1873	2,028
1882	5,782	1877	943	1872	3,485

This statement covers *main track only*, second or other additional tracks and sidings not being counted.

NEW PUBLICATIONS.

Root & Tinker, of New York, have published a series of large lithograph portraits of eminent men under the title of "Men of Mark," of a superior character, some of them being extraordinarily strong portraits. The ninth in the series is a portrait of Mr. Geo. B. Roberts, President of the Pennsylvania Railroad Company, which is a very excellent picture which many railroad men will be glad to possess.

The *National Car and Locomotive Builder* has issued its usual yearly *Supplement*. This is devoted chiefly to advertising, but contains some useful information, including lists of the locomotive shops, of the makers of car wheels, axles and springs, and of the rail-mills in the United States and Canada. There is also a list of Mexican and South American railroads and their officers. The matter in the *Supplement* which is most valuable, however, is a list of street railroad companies in the United States and their officers, information which, we believe, is not easily accessible elsewhere. These lists and the other information given have, apparently, been carefully compiled; the work was done by Mr. Wm. J. Trace, who was formerly with the *Railroad Gazette*.

Summer Tours on the Rome, Watertown & Ogdensburg Railroad is one of the most attractive of summer guide-books that has come under our notice. It is true that Mr. Butterfield, the General Passenger Agent of the road, has a remarkably good field to work in, the company's lines extending from Niagara Falls on the west to the St. Lawrence on the east, and taking in the picturesque shore of Lake Ontario, the Thousand Islands and the St. Lawrence Rapids, and skirting the Adirondack region and the North Woods. Of this abundant material good use has been made, both in description and illustration. The book is well provided with maps of a better quality than are generally given.

TECHNICAL.

Locomotive Building.

The shops of the Great Western Division, Grand Trunk, in Hamilton, Ont., are now building some heavy passenger engines. The engines have 6 ft. drivers, and 19 by 24 in. cylinders. In order to give proper support to the piston and prevent it dragging on the bottom of the cylinder, the piston rod is prolonged through the front cover, and therefore supported at each end by suitable bushes and glands. This device is used in many large marine and stationary engines, but is on locomotives the revival of an old practice which was used on some eastern roads 25 or 30 years ago. It is now often used in Germany and France. The result of the experiment on the Great Western will be awaited with considerable interest.

The Rogers Locomotive Works in Paterson, N. J., are building 7 Mogul freight engines with 17 by 24 in. cylinders for the Georgia Pacific road.

The Philadelphia & Reading shops in Reading, Pa., are building 4 passenger engines, specially intended for fast running on the passenger trains between New York and Philadelphia. These engines have 20 by 24 in. cylinders and 6-ft. drivers, and have the Wootten fire-box.

The New York, Lake Erie & Western Co. is about to build 20 new passenger engines, to burn hard coal.

The Baldwin Locomotive Works in Philadelphia are building 8 Mogul freight engines with 19 by 24 in. cylinders for the Georgia Pacific road.

The New York, Lake Erie & Western shops at Susquehanna, Pa., are to build 5 consolidation freight locomotive for use on the leased New York, Pennsylvania & Ohio road.

The Car Shops.

The St. Charles Car Co., in St. Charles, Mo., has secured a contract for 1,000 freight cars for the Atchison, Topeka & Santa Fe road, which will keep their works busy for some time.

The Southern Car Co., in Knoxville, Tenn., has taken a contract to build 200 flat cars for the East Tennessee, Virginia & Georgia road.

The Laclede Car Manufacturing Co., in St. Louis, has recently shipped street cars to Atlanta, Ga., Rock Island, Ill., Janesville, Wis., and Chattanooga, Tenn.

The Pullman Car Works, in Pullman, Ill., have just completed a train of 5 passenger cars for the Old Colony road. These cars are to be run on the steamboat train between Boston and Fall River. They are each 60 ft. long, and have seats for 78 passengers. The inside finish is of mahogany, and the seats have mahogany frames, with cushions and back upholstered in plush, and fitted with Hale & Kilburn springs. This train is provided with the electrical signal apparatus, in place of the usual bell cord.

The Georgia Pacific Co. has just given out contracts for 100 box, 10 stock and 415 coal cars.

The Wason Manufacturing Co., at Brightwood (Springfield), Mass., is building, among other orders, a combination mail and smoking car for the Connecticut River road, and two sleeping cars for a railroad in Chili, South America.

Bridge Notes.

The Vermont Construction Co. in St. Albans, Vt., is building an iron bridge across the arm of Lake Champlain between Alburg, Vt., and North Hero. The bridge will have 2 fixed spans of 150 ft. each and a draw-span 190 ft. long.

The Wrought Iron Bridge Co. in Canton, O., has taken a contract for several highway bridges in Mower County, Minn., and has a number of other contracts on hand.

The Chicago Forge & Bolt Co. has taken a contract for erecting a steel bridge over the Chicago River at 12th street for the city of Chicago. The contract price for the superstructure is $41,159.

The Phoenix Bridge Co. in Phoenixville, Pa., has the contract for the iron bridges on the extension of the Gulf, Colorado & Santa Fe road from Ft. Worth, Tex., northward into the Indian Territory, including the bridge over the Red river.

The Missouri Valley Bridge & Iron Co. in Leavenworth, Kan., has the contract for the iron bridges on the extension of the Dallas branch of the Gulf, Colorado and Santa Fe road, which is now under construction.

W. G. Coolidge & Co., of Chicago, have recently been awarded the following work: All the Howe truss bridges (25 spans) on the Kansas City Extension of the Chicago, Milwaukee & St. Paul; all the Howe truss beidges (7 spans) on the Sioux City & Astor Extension of the Chicago, Milwaukee & St. Paul; all the combination bridges (7 spans) on the Two Harbors Extension of the Duluth & Iron Range road; also the iron roofs for 4 smelting buildings at Lake Linden, Michigan.

Iron and Steel.

The North Chicago Rolling Mill Co. during the year ending Juue 30 last, turned out 193,270 tons of steel rails, 233,481 tons of steel ingots, 244,594 tons of pig iron, 31,237 tons of bar iron and steel, 12,009 tons of rail splices and 75,081 kegs of nails. The average number of men employed by this company in all its works during the year was 5,300. The pay rolls for the year amounted to about $2,550,000.

Anderson, Dupuy & Co., of the Pittsburgh Steel Works, have lately started up their works with natural gas employed throughout. They have built a new 20-ton open-hearth steel furnace and have added to their works a complete spring department in which they will make railroad and other springs.

The Western Nail Co. in Belleville, Ill., has recently added a Clapp-Griffith furnace to its plant and is turning out 65 tons of steel a day, running single turn.

Park Brothers & Co., of the Black Diamond Steel Works in Pittsburgh, are making some extensive improvements, including a new train of 16-inch rails, and also a train for rolling sheet steel.

The Delaware Rolling Mill at Phillipsburg, N. J., has shut down, and it is uncertain when it will be reopened.

The Glasgow Iron Co. in Pottstown, Pa., have let a contract to the Lewis Foundry & Machine Co. in Pittsburgh for a 24-inch blooming mill for rolling steel ingots.

The rolling mill at Kittanning, Armstrong County, Pa., started up July 29, after a stoppage of about 6 weeks.

Manufacturing and Business.

Mr. J. P. Witherow, in Pittsburgh, has a number of heavy contracts on hand for blast furnace and rolling mill machinery. His latest contract is for a new blast furnace at Saxton, in Bedford County, Pa. Mr. Witherow is running his works over-time, and expects to continue to do so for some time.

The Smith, Beggs & Ranken Machine Co. is furnishing a 500 H. P. Corliss engine for the Missouri Car & Foundry Co., and has a number of other orders on hand.

The Rail Market.

Steel Rails.—The market is quiet and steady and quotations continue unchanged at $34@$35 per ton at Eastern mills, the prices being graded according to size of the order and the time of delivery. It is understood that several small orders for steel rails have been placed in England. They are all for Texas or Pacific coast delivery, where the low prices of ocean freights enable the English makers to compete with northern mills in price.

Rail Fastenings.—Quotations continue unchanged at 2.40 cts. per lb. for spikes in Pittsburgh; 2.75@3 10 for track-bolts and 1.65@1.80 for splice-bars. A fair business is reported.

Old Rails.—The market for old iron rails is dull, buyers being unwilling to give the prices asked, and quotations are entirely nominal at $18@$19 per ton at tidewater. Old steel rails are quoted at $20@$22 per ton in Pittsburgh, with a light supply and only few sales.

The Meigs Elevated Railroad.

The Boston *Herald* of Aug. 6 thus describes a trip over the experimental section of road in East Cambridge, near Boston:

"The track is a curiosity of itself, starting on a level with the ground and rising by varying grades until it crosses Bridge street at a clear height of 14 ft. It is nearly a quarter of a mile in length, or, to be accurate, just 1,113.41 ft. It starts with a cheap wooden temporary track 95 ft. long, then comes a stronger wooden way of 132 ft., level and straight, followed by a wonderful half-circle having a radius of 50 ft. and rising with a grade of 120 ft. to the mile; 209 ft. of straight level wooden track is followed by 55 ft. of constantly increasing grade of 60, 120, 180, 240 and 300 ft.; another curve of 50 ft. radius on the astonishing grade of 345 ft. occupies 135.83 ft. of iron way, and then 45.97 ft. of iron way on a grade of 172.5 ft., takes the track to Bridge street which it crosses on a level grade 14 ft. clear above the street. This level grade, 275.64 feet in length, showing a general curve of 693 ft. radius made up of short, straight sections, completes the experimental track of the construction company. It is well known that the distinguishing characteristics of this road are the single line of posts, supporting a combination of lower rails which carry the load-bearing, which rolls upon them at an angle of nearly 45°, and an upper rail against which horizontal wheels run, and a truck which straddles the upper rail. The driving wheels of the locomotives are horizontal, and draft power is obtained by pressing them against the upper rail by hydraulic power. The engine is 29 ft. long and weighs 29 tons, the tender is 25¼ ft. long and weighs 14 tons, and the passenger car is 51 ft. long and weighs 19 tons, seating 72 passengers.

"After learning the above facts and many more from Capt. Meigs, the party was given a ride over the entire length of track, and the way in which the car was whisked round the curves and up the grades at the rate of nearly 15 or 20 miles an hour was a wonder to the visitors. While going round the half circle, the old story of people on the rear platform shaking hands across the country with the engineer was almost a reality, length of arm only being lacking. The control of the engineer over the train was proven by his going back down the grades at a slow speed; and the visitors appeared thoroughly satisfied with the success of the entire demonstration of the practicability of the road."

20-Inch Beams.

The Bessemer Steel Works at Homestead are making bridge beams that are 20 in. wide. We believe that no larger bridge beams are rolled in the world. The same size are made in Belgium, and at Trenton, N. J. The company has a very large order on hand for this specialty.—*American Manufacturer, Pittsburgh.*

The Half-Year's Iron Business.

Commenting on its statistics of iron and steel production in the first half of this year, the *Bulletin* of the American Iron and Steel Association says:

"The statistics of our iron and steel industries which we published last week are of sufficient importance to merit a few words of comment for which we could not then find room in our columns.

"First, we will be excused for reminding our readers that seven months ago, at the close of 1885, we gave in detail our reasons for taking a hopeful view of the business situation. We showed that there then existed a positive revival in the American iron trade, and we gave what we believed to be substantial reasons for the belief that 1886 would be an active year for this trade. The result thus far abundantly justifies our hopeful view. We made more pig iron, more Bessemer steel, and more open-hearth steel in the first six months of 1886 than in any previous six months in our history, and we made almost as many steel rails as in any previous six months. There has been equal activity in at least one other branch of our iron and steel industries for which statistics are wanting—the manufacture of cast and wrought iron pipe. The demand for cast-iron pipe for the water supply of our towns and cities has been very great, and the demand for wrought-iron pipe for the supply of natural gas, which demand became so marked a feature of the iron trade a year or more ago, has steadily increased during the present year. There has also been great activity in the use of iron and steel for building purposes. This use of iron and steel is rapidly growing in this country.

"It is important to observe that the large quantities of pig iron, steel rails, and other products which have been produced in this country since the revival in the iron trade in the latter part of 1885 have gone into immediate consumption. Stocks of pig iron have not accumulated; the steel rails made have been laid down. All this has taken place without the least sign of excitement; substantial causes have brought healthy results. The country is growing in population, having now over sixty millions of people within its borders; it has an abundance of good money; since the latter part of 1885 there has been a revival in railroad building; we have been blessed with good crops; prices of iron and steel have wisely been kept within reasonable limits, by which we have mainly retained the home market for home producers. Altogether the conditions have been favorable for a large consumption of iron and steel."

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Cincinnati, Hamilton & Dayton, special meeting, at the office in Cincinnati, Aug. 26, to vote on the proposed issue of preferred stock to retire the outstanding bonds.

Housatonic, special meeting, in Bridgeport, Conn., Sept. 15, to vote on the lease of the Danbury & Norwalk road.

Nashville, Chattanooga & St. Louis, annual meeting, in Nashville, Tenn., Sept. 15. Transfer books closed June 16.

Northern Pacific, annual meeting, at the office in New York, Sept. 16. Transfer books close Aug. 2.

St. Paul, Minneapolis & Manitoba, annual meeting, at the office in St. Paul, Minn., Aug. 19. Transfer books close July 21.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

North Pennsylvania (leased to Philadelphia & Reading), 2 per cent., quarterly, payable Aug. 25, to stockholders of record on Aug. 11.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Master Car & Locomotive Painters' Association* will hold its annual convention in Chicago, beginning on Wednesday, Sept. 8.

The *Brotherhood of Locomotive Firemen* will hold its annual convention in Minneapolis, Minn., beginning on Wednesday, Sept. 15.

The *National Association of General Passenger & Ticket Agents* will hold its next meeting at the Hotel Brunswick in New York on Tuesday, Sept. 21.

The *General Time Convention* will hold its fall meeting in New York, on Wednesday, Oct. 18.

The *Western Society of Engineers* holds regular meetings at its hall, No. 15 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

Transportation in Congress.

At the recent session of Congress bills became law forfeiting the Atlantic & Pacific grant of 28,371,000 acres, and several grants made to Southern companies, amounting to about 7,000,000 acres in all.

The bills which passed the House forfeiting the New Orleans Pacific grants, the Gulf & Ship Island grant and the Northern Pacific grants did not pass the Senate, but will probably come up again next winter.

National Association of General Passenger and Ticket Agents.

The regular semi-annual meeting of this Association will be held in New York, at the Hotel Brunswick, on Tuesday, Sept. 21, beginning at 11 o'clock a. m. Special arrangements have been made by the proprietors of the hotel to care for all the members, on either the American or European plan. Blank credentials will be furnsihed new members at the meeting.

Contracting Freight Agents' Association.

At a meeting held in Sandusky, O., Aug. 7, an association was formed to be known as the Contracting Freight Agents' Association of the Middle and Western States. The organization is entirely for social and beneficial purposes. At the Sandusky meeting officers were elected and a constitution and by-laws adopted and arrangements were made for future meetings.

Baltimore & Ohio Employes' Relief Association.

The July sheet of this Association shows the payment of benefits as follows: Main Stem, Transportation Department, 92; Machinery Department, 202; Road Department, 75; Baltimore & Philadelphia, 6; Pittsburgh Division, 69; Trans-Ohio Divisions, 153; physicians' bills, 87; a total of 684 payments.

ELECTIONS AND APPOINTMENTS.

Boston & Lowell.—The following notice has been issued by the President, under date of Aug. 1: "Colonel A. B. Jewett, having accepted the position of Vice-President of the St. Johnsbury & Lake Champlain Railroad Co., the duties of Superintendent of the Vermont Division will hereafter be performed by Mr. W. A. Stowell, until further notice. Mr. Stowell will have his office at Woodsville, New Hampshire."

Burlingame, Lyndon & Southern.—The directors of this new company are: L. E. Finch, H. D. Shepard, Max Buck, Elisha Olcott, L. T. Wilson, S. B. Enderton and J. W. Hammond. The principal place of business will be at Burlingame, Kansas.

Cedar Rapids & Chicago.—The officers of this company are: President, J. B. Young, Cedar Rapids, Iowa; Vice-President, J. M. Butler, Philadelphia; Chief Engineer, A. W. Swanitz, Cedar Rapids, Iowa.

Cherryvale, Paola & Kansas City.—The officers of this company are: President, C. A. Mitchell, Cherryvale, Kan.; Secretary, W. D. Greason, Paola, Kan.; Treasurer, J. M. Allen, Erie, Kansas.

Chicago, Burlington & Northern.—Mr. Charles Doogan has been appointed Freight Auditor, with office in St. Paul, Minn. Mr. Doogan has been for 20 years connected with the Chicago, Burlington & Quincy and has been for a long time Chief Clerk in the Freight Auditor's office.

Chicago, Madison & Northern.—The directors of this new company are: James C. Clarke, E. T. Jeffrey, John C. Welling, Chicago; Stuyvesant Fish, E. H. Harriman, Walter Luttgens, New York. They are all connected with the Illinois Central.

Mr. Edward T. Jeffrey has been appointed General Manager of the new company, with office in Chicago, and has issued the following as his first official order: "Mr. Isham Randolph is appointed Chief Engineer of the Chicago, Madison & Northern Railroad, with office at No. 78 Michigan avenue, Chicago."

Cleveland & Mahoning.—This company (whose road is leased to the New York, Pennsylvania & Ohio) has elected Stevenson Burke President; E. E. Poppleton, Secretary; E. B. Perkins, Treasurer.

Cleveland & Western.—The directors of this new company (successor to the Cleveland, Delphos & St. Louis) are: James Callery, Wm. Semple, Pittsburgh, Pa.; C. W. Straw, Corry, Pa.; A. W. James, Youngstown, O.; James Semple, Toledo, Ohio.

Contracting Freight Agents' Association of the Middle & Western States.—The officers of this Association are: President, J. D. Welsh, Union Pacific; Vice-President, W. W. Whitacre, Lake Shore & Michigan Southern; Secretary, James N. Veitch, Chicago, Milwaukee & St. Paul; Treasurer, L. S. Fairchild, Baltimore & Ohio.

Cumberland Valley.—The following circular from President Thomas B. Kennedy is dated Chambersburg, Pa., Aug. 5: "Mr. H. A. Riddle is appointed General Passenger Agent, in place of Mr. A. H. McCulloh, resigned. Appointment to take effect at this date."

Denver & Rio Grande.—Mr. Wm. S. Jackson, President of this company, as reorganized, announces the following appointments: General Superintendent, R. E. Ricker; Treasurer, J. W. Gilluly; Secretary, William Wagner; General Counsel, E. O. Wolcott; Assistant to the President, R. F. Weitbrec; Traffic Manager, A. S. Hughes; Auditor, E. R. Murphy; Assistant General Superintendent, W. W. Borst; General Passenger and Ticket Agent, S. K. Hooper; Manager of Express, G. W. Kramer; Superintendent of Motive Power and Machinery, N. K. Sample; Principal Engineer, F. P. King; Superintendent of Bridges and Buildings, J. R. Chapman; Purchasing Agent, C. M. Hobbs; Land, Tax and Claim Agent, W. M. Hastings; Superintendent of Telegraph, R. A. Hutchison; Superintendent First and Third divisions, W. W. Borst; Superintendent Second Division, Cole Lydon; Superintendent Fourth Division, R. M. Ridgway; Assistant General Freight Agent, C. F. Zimmerman; Assistant Superintendent Express, S. A. Walker; Superintendent Car Service, J. B. McCormic; Chief Storekeeper, E. J. Seeley; Freight Claim Agent, C. Tucker; Stationer, W. B. Tuttle.

Denver & Rio Grande Western.—The following circular from President Wm. J. Palmer is dated Salt Lake City, Utah, July 29:

"The following appointments have been made by the board of directors of this company, to take effect immediately: David C. Dodge, General Manager; Wm. H. Bancroft, General Superintendent; Jos. W. Gilluly, Cashier; J. H. Bennett, Auditor."

The Receiver has been retired and the road is now operated by the company.

Fargo, Devil's Lake & Turtle Mountain.—The officers of this new company are: President, Otto B. Spencer; Vice-President, P. N. Scotland; Secretary, H. M. Creel; Treasurer, Morris Thomas. Office in Fargo, Dakota.

Fort Worth & New Orleans.—Mr. John F. Lehane has been appointed Auditor, with office in Fort Worth, Tex. He was recently on the Texas & Pacific road.

Galveston, Sabine & St. Louis.—At a meeting held in Longview, Tex., Aug. 3, all the old officers, known as the Barner board, resigned, and their positions were filled for the ensuing year by the election of the following officers: R. J. Evans, President; G. D. Harrison, Vice-President; W. W. Wood, Secretary and Treasurer; I. H. Crutcher, A. S. Taylor, J. M. Mobberly, Thos. R. Smith, of New York, Thos. B. Sloo, of New Orleans, and John F. Hull, of Carthage, Tex., directors.

Lake Superior & Pacific.—This company has elected officers as follows: President, J. R. Myers; Vice-President, George J. Mallory; Secretary, J. W. Paine; Treasurer, A. J. Whitman. Office in Duluth, Minnesota.

Mexican Central.—Mr. Joseph H. White, of Brookline, Mass., has been chosen a director in place of B. P. Cheney, resigned.

Minneapolis Union.—This company has elected Mr. J. J. Hill, President; A. Manvel, Vice-President; E. Sawyer, Treasurer. The road is controlled by the St. Paul, Minneapolis & Manitoba.

Mississippi & Leach Lake.—The officers of this new company are: President, Ashley C. Morrill, Brooklyn, N. Y.; Vice-President, Edward M. Johnson, Minneapolis, Minn.; Secretary, William C. Johnson, Little Falls, Minnesota.

New Orleans, Natchez & Fort Scott.—This company was organized at Vidalia, La., Aug. 10, with the following officers: L. T. Bush, President; U. H. Rice, Vice-President; H. W. Bush, Secretary; Isaac Lowenburg, Natchez, Assistant Secretary; Charles Nelson, Treasurer; H. B. Whiteman, Engineer; A. A. Harris, General Attorney.

New Orleans & Northwestern.—This company was organized in Natchez, Miss., Aug. 10, with the following officers: J. H. Rice, Fort Scott, Kan., President; L. T. Bush, Lancaster, Pa., Vice-President; H. W. Bush, of Pennsylvania, Secretary; J. W. Lambert, Natchez, Assistant Secretary; C. C. Drake, Fort Scott, Treasurer. H. B. Whitman was chosen Chief Engineer, and A. A. Harris, of Fort Scott, General Attorney; K. P. Lanneau, Natchez, Assistant Attorney.

Richmond & Danville.—Mr. T. W. Gentry, recently of the Atlanta & Charlotte Air Line Division, has been transferred and appointed Master Mechanic of the Richmond & Danville Division, with office in Richmond, Va. Mr. A. W. Gibbs is appointed Master Mechanic of the Atlanta & Charlotte Air Line Division, with headquarters in Atlanta, Ga., to succeed Mr. Gentry.

St. Louis & Chicago.—Mr. A. C. Turner has been appointed Traffic Manager, with office in Springfield, Ill. He was recently connected with the Cleveland, Columbus, Cincinnati & Indianapolis.

St. Louis Southern.—The office of this new company is at Pinckneyville, Ill.; the directors are E. C. Dawes, L. M. Dodd, S. T. Brush, C. W. Fairbanks, C. H. Bosworth, R. J. Cavett and J. M. Richart.

Salina, Columbus & Southeastern.—The officers are: President, W. B. Stone; First Vice-President, C. Blair; Secretary and Treasurer, R. A. Long; General Manager, E. A. Crewson; Chief Engineer, Charles L. McClung, Columbus, Kansas.

San Antonio & Aransas Pass.—Mr. U. Lott, President and General Manager, has issued the following, dated San Antonio, Tex., Aug. 5:

"Mr. J. P. Nelson having been appointed Chief of Construction for this company, has full charge of survey and location, and all matters pertaining to construction work on the Northwestern Extension, Waco and Sealey branches, and has full authority to make labor and material contracts pertaining to construction of above named lines."

Sioux City, Bismarck & Fort Benton.—The office of this new company is in Sioux City, Ia.; the directors are D. T. Hedges, John Pierce, A. S. Garretson, T. P. Gere, Craig L. Wright, F. C. Hills, A. W. Irwin, John Hornick and James E. Boge.

Sonora.—At the annual meeting last week the old directors and officers were re-elected. The road is owned by the Atchison, Topeka & Santa Fe.

Texas & Pacific.—Mr. J. H. Redmond has been appointed Division Superintendent, with office at Marshall, Texas.

Virginia, Tennessee & Georgia Air Line.—The following from General Manager Henry Fink, is dated Knoxville, Tenn., July 31:

"Mr. Edwin Fitzgerald has been appointed General Western Agent of the Virginia, Tennessee & Georgia Air Line. His office will be at Louisville, Kentucky."

Western, of Florida.—Mr. O. Budington is appointed General Superintendent, with office at Green Cove Springs, Florida.

PERSONAL.

—Mr. A. H. McCulloh has resigned his position as General Passenger Agent of the Cumberland Valley Railroad.

—Mr. J. M. Reid, a civil engineer of Pilot Point, Tex., has accepted a position as Division Engineer on the new Trans-African Railroad, and will shortly sail for Africa to begin work.

—Mr. J. F. McGhee has resigned his position as Superintendent of Bridges of the Georgia Division of the East Tennessee, Virginia & Georgia road, to accept a position on the Mobile & Ohio.

—Col. A. B. Jewett has resigned his position as Superintendent of the Vermont Division of the Boston & Lowell Road. Mr. Jewett has taken this action in consequence of his election as President of the St. Johnsbury & Lake Champlain Railroad Co.

—Mr. F. J. F. Bradley, for some time past Manager of the Pullman Car Works, at Pullman, Ill., was removed from his position Aug. 2. Mr. Bradley has not been seen since, and it is reported that he has disappeared from his residence in Chicago.

—The inspector who made the report on the Fifth avenue paving contract to the Commissioner of Accounts of New York city—reports which have attracted a great deal of attention—is Col. Geo. T. Balch, who made the immense inventory of the Erie Railway when it was under the receivership.

—A report is telegraphed from St. Louis that Mr. H. M. Hoxie will shortly retire from the active duties of his position as General Manager of the Missouri Pacific lines, but that he will retain the position of First Vice-President with general supervision over the operations of the company. The change, it is stated, will be made on account of Mr. Hoxie's desire for relief and rest.

—Mr. Charles P. Clark, President of the New York & New England Co., has received from English shareholders of the road an elegant solid silver fruit and flower receiver. The testimonial is of massive proportions, being 20 in. in height and 15 in. in diameter at the top and gold lined. It is urn-shaped, with heavy handles on either side, and is artistically embellished with tasteful floral designs. The front surface bears the following inscription: "Presented to Charles P. Clark, President of the New York & New England Railroad Co., by some English shareholders, in grateful recognition of his successful efforts to retrieve the fortunes of the company."

—Col. George L. Perkins, Treasurer of the Norwich & Worcester Railroad Co., is undoubtedly the father, or perhaps he might be more fittingly called the grandfather, of the numerous family of railroad officers of the United States. The 99th birthday of Colonel Perkins was celebrated on the evening of Aug. 7, by a complimentary banquet tendered him by his associates and friends at Port Griswold House in Groton, Conn. Col. Perkins has been Treasurer of the Norwich & Worcester Co. since its first organization, 50 years ago, and is still active, despite of his great age, and attends to his daily duties with a regularity which has characterized his whole business life. He is undoubtedly the oldest railroad officer in the United States.

—Sir John Anderson, an English mechanical engineer of considerable reputation and great ability, died on July 28. Sir John was for 33 years connected with the government arsenals of Woolwich and Enfield, and successfully introduced numerous improvements in the manufacture of ordinance, small arms and ammunition, including the system of interchangeable parts. He was at the head of the British jurors at the Centennial Exhibition at Philadelphia in 1876. He was an admirable lecturer upon mechanical subjects and wrote a text-book on the strength of materials. Sir John was born at Woodside, near Aberdeen, Scotland, in 1814, and in 1881 presented his native village with a free library which cost $30,000.

TRAFFIC AND EARNINGS.

Central Traffic Association.

Commissioner Blanchard has called a general meeting, to be held at Commissioner Fink's office in New York, Aug. 18, at which the following subjects will be presented:

1. The divisions of freight traffic agreed to but not yet completed, and such others as may be deemed requisite for the general interest.
2. Additional measures for maintaining rates and fares.
3. The propriety of including in the present or supplementary freight agreements short-freight traffics now included.
4. The desirability of appointing a permanent arbitrator or arbitrators for the association.
5. The majority and minority reports of the percentage committee.
6. The consideration of the proposed general contract of the association.
7. Pending the adoption of a general agreement, the passenger agreement formerly agreed to will be presented for consideration and signature.
8. Measures to limit special passenger fares.
9. The consideration of the differential basing fares desired by the Chicago & Grand Trunk Co. eastwardly *via* Montreal.
10. To progress passenger arbitration.
11. Any other questions that may be presented in either the freight or passenger departments of the association.
12. Any questions of mutual interest which the trunk line executive committee or Commissioner Fink may desire considered.

The conference committee upon the relations of this association to the trunk lines and the joint committee are respectfully requested to convene at the same time and place.

As important passenger questions are to be considered, a full attendance of the general passenger and ticket agents is requested.

Classification of Dry Goods.

A conference was held in New York, Aug. 11, between the committee of dry-goods merchants and members of the Trunk Lines Executive Committee. The Merchants' Committee prepared a list of goods for rating as third class, whether in assorted or original packages. The list comprises sheetings and shirtings, bleached and brown; cottonade ticks, denims, sheeting, stripes and checks, ducks, drills, brown or bleached; calicoes, ginghams, corset jeans, brown bleached or colored; colored cambrics, cotton grain bags, apron checks and single-face cotton flannels. They also offered to present and advocate the passage of a law imposing a penalty on shippers for shipping freight under a different name or in a lower class than that to which it actually belongs. The propositions will be submitted to the Executive Committee.

The Canadian Pacific's First Through Freight.

An Ottawa dispatch of Aug. 5 says: "A train of 13 cars, containing the second load of tea direct from Yokohama, has arrived at Winnipeg. Eight cars go to Brockville, two to Montreal, and three to Chicago. Another train of 10 cars is on the way from Victoria to Montreal."

Lake and Canal Rates.

The Buffalo *Commercial Advertiser* says: "The magnitude of the business being done at this port this year is little appreciated. Prices for breadstuffs are low and the foreign demand is comparatively light, yet enormous quantities of breadstuffs are going forward through Buffalo. With one exception, that of 1880, this year's movement is the greatest on record. The receipts of flour aggregate 1,935,778 barrels for the season, which is an average of 21,000 barrels for every day including Sundays. The receipts of grain reach 31,435,585 bushels, exclusive of flour. The total shipments of grain by canal to Aug. 1, were 18,912,850 bushels to 12,537,000 last year. The shipments of coal west by lake, aggregating 655,468 tons, is the heaviest coal movement on record, and the exports of cement, salt and railroad iron are considerably in excess of those for last season. The freights paid by this large business have been fairly remunerative, as will be seen by the following statement of the average rate on wheat and corn from Chicago to Buffalo by lake, and from Buffalo to New York by canal, during the month of July, in the years named:

	Lake.		Canal.	
	Wheat. Cents.	Corn. Cents.	Wheat. Cents.	Corn. Cents.
1886	2.7	2.5	4.0	3.6
1885	1.3	1.1	3.0	2.8
1884	1.9	1.7	3.6	3.2
1883	2.5	2.3	3.9	3.6
1882	1.9	1.7	4.4	4.0
1881	2.6	2.9	4.3	3.8
1880	4.8	4.3	6.0	5.4
1879	2.5	2.3	5.2	4.7
1878	1.7	1.5	4.3	3.8
1877	2.6	2.2	5.4	4.7
1876	1.9	1.2	5.9	5.4

"The difference in the situation this year, as compared with last, may be judged from the fact that wheat was taken in Chicago for days together in July, 1885, for 1 cent a bushel to Buffalo, and at no time in the month was 1¾ cents exceeded, while the average for the July just passed is nearly 3 cents a bushel."

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1886.	1885.	Inc. or Dec.	P. c.
Seven months to July 31:				
Canadian Pac....	$5,150,342	$4,260,465	I. $889,877	20.9
Chi. & Nor'west.	12,907,299	12,717,092	I. 190,207	1.5
C., St. P., M. & O.	3,182,861	2,983,394	I. 199 467	6.7
Chi. & W. Mich.	769,798	708,868	I. 60,430	8.5
C., I., St. L. & C.	1,409,201	1,326,711	I. 82,590	6.2
Cin., W. & Balt.	1,061,036	957,793	I. 103 243	10.8
Den & R. G.....	3,497,718	3,284,101	I. 213,617	6.5
Den. & R. G. W.	552 311	519,699	I 32,612	6.3
Det., Lan. & No..	670,990	647,438	I. 23.552	3.7
Ev. & T. Haute..	422,159	395,673	I. 26,486	6 6
Flint & Pere Mar.	1,251,906	1,086,958	I. 165,038	15.2
Grand Trunk. ...	9,118 849	8,240,814	I. 878 035	10.6
Gulf, Col. & S. F.	1,103,386	738,734	I. 364 652	49 3
Ill. Central	5,494 935	5,859,238	D. 364.303	6.2
Iowa lines.... ..	891,257	883,831	I. 7.426	0.8
Ind., Bloom. & W.	1,349,238	1,228 887	I. 120 351	9.8
Lou , Ev. & St. L.	457.968	387,624	I. 70,344	18.0
Louisv. & Nash..	7,540,041	7,892,190	D. 352,149	4 5
Marq., H. & Ont.	514 352	405,546	I. 108,806	27 0
Mexican Central .	2,123.864	2,151,169	D. 30,305	1.4
Mil. & Northern..	343,655	320,785	I. 22.870	7.1
N. Y. City & No..	304,526	240,031	I. 64 495	26.9
N. Y., Out. & W.	717,476	681,230	I. 36 248	5.3
Norfolk & West..	1,686.645	1,424,427	I. 262,218	18.6
Northern Pacific..	6,108,122	5,606,441	I. 501,681	8 9
Ohio & Miss.....	2,077,877	2,020,215	I. 57,662	2.9
Ohio Southern....	261,488	226,830	I. 34 658	15 1
Peoria, Dec. & E.	407,784	381,021	I. 26,763	7 0
St. Jo. & Gd. I.	624 975	559,503	I. 65,472	11 7
St. P. & Duluth.	700 843	616,037	I. 84,806	13.7
St. P., M. & Man.	3.504,880	3,697,305	D. 192,425	5.2
Wab , St.L & P..	6,899 319	6,332,257	I. 567,062	8.6
Wisconsin Cent..	802,190	829,425	D. 27,235	3.3
Six months to June 30:				
Boston & Albany.	$3,800,457	$3,507,413	I. $293,044	8.3
Net earnings....	1,135,682	933,924	I. 201,758	21.6
Canadian Pac. ..	4,160,343	3,352,827	I. 807,516	24.1
Net earnings....	1,293,615	1,114,408	I. 179,207	16.1
Ches. & Ohio....	1,819,817	1,566,415	I. 252,402	16.2
Net earnings...	503 719	367,984	I. 135,735	36 9
Ches., O. & S. W.	730 269	701.625	I. 28,645	4.1
Net earnings....	226,944	179 353	I. 47,591	26.4
Eliz., Lex. & B. S.	393,457	316,008	I. 77,449	24.2
Net earnings ..	125,659	97,151	I. 28,508	28.6
Den & R. G. W..	369,538	.....	.....	....
Net earnings..	141,416	.....	.....	...
Gal., Ha. & S. An	1,233.339	1,383 660	D. 150,321	10 7
Net earnings ...	88,650	577,927	D. 489,277	84.6
Gulf., W. T. & P.	23,320	.....	.....	...
Net earnings...	*6,730	.....	.....	...
Louisiana West..	300.465	287,813	I. 12 652	4 4
Net earnings....	144,018	148,594	D. 4,576	3.1
Louis., N. O. & T.	731,477	599,105	I. 132,372	11.1
Net earnings...	132 372	51,095	I. 81.277	159.3
Mil., L. S. & W...	942,768	560,128	I. 282,640	54.7
Net earnings...	421.472	148,612	I. 272,860	18.4
Morgan's La. & T.	1,949,282	1,842 994	I. 106,288	5.6
Net earnings .	448,330	620,751	D. 172,421	27.8
N. Y., C. & St. L.	1,732,835	1,509,158	I. 223,677	14.8
Net earnings...	566,928	383,036	I. 183,892	48.0
N. Y., N. H. & H.	3,495,790	3,190.095	D. 305,695	9.6
Net earnings...	1,228,394	1,374,000	D. 145,606	10.6
N. Y , Tex & M.	61 931	.....	.....	....
Net earnings...	*10.666	.....	.....	...
Ohio & Miss.....	1,730.719	1,738,415	D. 7,696	0.4
Net earnings....	423,958	384,715	I. 39,243	10.2
Tex. & N. Orl'ns.	450,949	449,349	I. 1.600	0.3
Net earnings...	182,136	184,710	D. 2,574	1.4
Texas & Pacific ..	2,530,087	2,165,431	I. 334,656	15.5
Net earnings...	222,319	.....	.....	....
Five months to May 31:				
Peoria, Dec. & E.	$280,446	$280.545	D. $99	....
Net earnings...	119,382	116.036	I. 3,346	2.9
Month of May:				
Peoria, Dec. & E.	$56,523	$50,508	I. $6.015	11.8
Net earnings ...	23,037	16,027	I. 7.010	43.8
Month of June:				
Canadian Pac.....	$895.923	$734,862	I. $161,061	21.9
Net earnings...	376.450	283,491	I. 92,959	32.8
Ches. & Ohio	322 799	249.521	I. 73,278	29.3
Net earnings...	71.774	59,986	I. 11.788	19.6
Ches., O. & S. W.	122.607	113,361	I. 9.246	8.2
Net earnings...	38,255	29,012	I. 9.243	31 9
Eliz., Lex. & B. S.	67,412	52,761	I. 14,651	27.8
Net earnings...	21,594	21,839	D. 245	1.1
Den. & R. G. W..	89,428	.....	.....	....
Net earnings....	35,120	.....	.....	...
Gal., Ha. & S. A..	201,966	225.587	D. 23,621	10.5
Net earnings...	*2,909	84,224	D. 87.133	...
Gulf, W. T. & P...	2,916	5,659	D. 2,743	44.6
Net earnings....	*2 612	4,148	D. 6,760	...
Louisiana West..	48.710	43 379	I. 5,330	12.4
Net earnings...	21,333	20 926	I. 407	1.9
Lou., N O. & T.	101,679	67,147	I. 34.532	51.5
Net earnings....	15,781	*10.687	I. 26,468	...
Mil., L. S. & W..	236,132	102 960	I. 133,172	129 3
Net earnings. ..	117.563	20,794	I. 96,769	450.0
Minn & N. W	43 715	.....	.....	....
Net earnings...	24.355	.....	.....	...
Morgan's La. & T.	259,677	255.584	I. 4,093	1.6
Net earnings. .	13.195	63.724	D. 50,529	79 2
N. Y., Tex. & M..	12,438	24,100	D. 11,662	48.6
Net earnings...	352	8,345	D. 7,993	95.1
Ohio & Miss.....	308,119	264,201	I. 43,918	16.6
Net earnings...	83,462	71.895	I. 11.567	16.1
Tex. & N. Orl'ns.	80,081	73,729	I. 6,352	8.6
Net earnings...	34.571	28.449	I. 6,122	21.8
Texas & Pacific..	403,069	371.484	I. 31.586	8.5
Net earnings...	*60,213	*23,785	I. 36,428	151 0
Month of July:				
Cairo, V. & C....	$68 873	$38.124	I. $30,749	80.6
Canadian Pacific.	990.0 0	907,618	I. 82.362	9 1
Chi. & Nor'west..	2,127,700	2,036,800	I. 90.900	4.4
C., St. P., M. & O.	486,600	468,800	I. 17.800	3.8
Chic. & W. Mich..	125,200	106,966	I. 18,234	17.2
Cin., I., St. L. & C.	212,200	177,087	I. 35,113	19.8
Cin., W. & Balt.	150,820	119,140	I. 31,680	26 6
Den. & R. G.....	609,537	548,295	I. 61,342	11.2
Den. & R. G. W..	85,400	86,175	D. 775	0.9
Det., Lan. & No..	107,612	93,592	I. 14,020	15.0
Ev & Terre H ...	83,825	66,643	I. 17,182	25.3
Flint & Pere Mar.	178,594	154.849	I. 23,745	15 3
Grand Trunk.	1,680,976	1,407,177	I. 273,799	19.4
Gulf, Col. & S. F..	192,000	139.430	I. 52 570	37.6
Illinois Central...	809,248	723,007	I. 86 241	11 9
Iowa lines.	128.504	134,111	D. 5,607	4.2
Ind., B & W.....	218,239	167,665	I. 50,574	30.1
Lou., Ev. & St. L.	84,012	69,400	I. 14,612	21 0
Louis. & Nash...	1,241,995	1,057,332	I. 184,663	17.4
Ma q., H. & O....	139.513	120,993	I. 18,520	15.4
Mexican Cen.....	277,600	268,384	I. 9,216	3.4
Mil. & Northern.	51.988	46,808	I. 5.180	11.0
N. Y. City & No.	50,176	41,426	I. 8,750	21.1
N. Y., Ont. & W.	144,711	136,074	I. 8.637	6.2
Norfolk & West..	237,256	187,397	I. 49,859	26.6
Northern Pacific..	1,120,865	1,000 011	I. 120,854	12.1
Ohio & Miss	347,156	281,799	I. 65 357	23.2
Ohio Southern....	34.906	25,054	I. 9,852	39.4
Oregon R. & N....	424,800	405,876	I. 18,924	4.7
Net earnings..	182,700	195,864	D. 13,164	6.6
Peoria, Dec. & E.	71 992	52,531	I. 19,461	36.7
St. Jo. & Gd I .	77.992	61 985	I. 16.007	36.1
St. P. & Duluth..	133,679	146.234	D. 12,555	8.6
St. P., M. & Man..	570.064	550,387	I. 19.677	3.6
Wab., St. & P....	1,057.351	838,099	I. 219.252	26.0
Wisconsin Cent...	116,166	118,507	D. 2,341	1.9
First week in August:				
Chic. & Atlantic..	$27,306	$22,252	I. $5,054	22.9
Chi. & East. Ill..	34,701	30 470	I. 4,231	13.9
Chi., Mil. & St. P.	421.000	392,743	I. 28,257	7.2
Mil., L. S. & W..	55.695	27,442	I. 28.253	103 1
St. Louis & San F.	86,500	74,500	I. 12,000	16.1

* Deficit.

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

Cotton.

Cotton movement for the week ending Aug. 6 is reported as follows, in bales:

	1886.	1885.	Inc. or Dec.	P.c.
Interior markets:				
Receipts.....	4,716	2,904	I. 1.812	62.5
Shipments.....	12,535	2,227	I. 10,308	462.2
Stock, Aug. 6	49,807	21,255	I. 28,552	134.0
Seaports:				
Receipts.	7,624	2,038	I. 5,586	273.8
Exports.....	24.255	13,955	I. 10.300	73.6
Stock, Au . 6.....	199,425	191,075	I. 8,350	4.4

The total shipments from plantations for the crop year to Aug. 6 are estimated at 6,469.387 bales, against 5,814,634 last year, 5,649,007 in 1883–84 and 6,955,229 in 1882–83.

Coal.

Anthracite coal tonnage for the week ending July 31 was 425,567 tons, against 477,447 last year, a decrease of 51,880 tons, or 10.8 per cent. The total tonnage to July 31, as given by the weekly reports was, this year, 16,962,412; last year, 15,909,916; increase, 1,052,496 tons, or 6.6 per cent.

The anthracite coal market is less active than usual at this season. The companies are reported to be keeping pretty well the agreement to maintain prices, and dealers are probably holding off in hope of a break.

Bituminous coal tonnages for the seven months to July 31 are reported as follows:

	1886.	1885.	Inc. or Dec.	P.c.
Cumberland, all lines..	1,114,046	1,549,070	D. 435,024	28.1
Hun. & Broad Top	217,383	94,313	I. 123,070	130.5
Bar. R.R. & Coal Co...	113,769	136,688	D. 22,919	16 8
Beech Creek...	550,529	420,086	I. 130,443	31.1
Pennsylvania R. R:				
Clearfield.	1,141,871	1,732,766	D. 590,895	34.1
Mountain District....	419,806	295 892	I. 124,914	41.9
Penn and Westmore.	612,444	646,861	D. 27.417	4.2
Minor districts.....	808,467	606.585	I. 201,882	33.2
Norfolk & Western....	469.190	322,897	I. 146,293	45.3
Chesapeake & Ohio....	643,828	607,323	I. 36,505	6.0
Total bituminous ...	6,098,333	6,412,481	D. 314,148	4.9

The changes in these tonnages are chiefly due to the stoppage of production in several of the districts by strikes. These limited production in the districts affected and at the same time caused an increase in others, which were able to fill the unexpected demand upon them. This has worked to the advantage of the Virginia lines, which are trying to secure new markets for their coal. In one case known to us, which is doubtless a type of others, a cargo of Pocahontas coal was picked up in an Eastern port as a stop-gap in an emergency, and the coal was so much liked that the result was a contract for a regular supply.

Coke tonnages for the seven months to July 31 are reported as follows:

	1886.	1885.	Inc. or Dec.	P c.
Southwest Penna. R. R....	1.450,156	1.127.748	I. 322.408	28.7
Other districts, Pa. R. R .	460.628	343.061	I. 117.567	34.3
Connellsville, *via* Pa. R. R.	26.882	35,846	D. 8.964	24.9
Total coke.....	1,937,666	1,500.655	I. 431,011	28.6

All these tonnages are over the Pennsylvania Railroad and its branches, no other company reporting coke shipments. The improvement in the iron trade has furnished an active market for coke this year, and the ovens are now nearly all busy, shipments being limited only by the supply of cars.

Cumberland coal shipments for the week ending Aug. 7 were 67,940 tons. Total to Aug. 7 this year, 1,181,986; last year, 1,597,060; decrease, 415,074 tons, or 25.9 per cent.

Actual tonnage passing over the Pennsylvania & New York road for the eight months of the fiscal year from Dec. 1 to July 31 was:

	1886.	1885.	Inc. or Dec.	P. c.
Anthracite.....	1,008,216	763 567	I. 244,649	32.0
Bituminous.....	122,713	156 833	D. 34,120	21.7
Total	1,130,929	920,400	I. 210,529	22.9

The larger part of the anthracite comes from the Lehigh Valley road, of which this line is an extension.

St. Louis coal receipts for the seven months to July 31 were:

	1886.	1885.	Inc. or Dec.	P.c.
Coal...	1,028,128	1,046.496	D. 18,368	1.7
Coke...	50,754	18,819	I. 31,935	169.8
Total.....	1.078,882	1.065,315	I. 13,567	1.2

Chicago coal receipts for July and the seven months to July 31 are reported by the *Coal Trade Journal* as follows:

	July.		Seven months.	
	1886.	1885.	1886.	1885.
Anthracite.....	178,379	132,660	683,604	564,221
Eastern bituminous....	94,311	58,780	490,414	522,024
Illinois.....	73,654	63,448	596,006	647,427
Indiana.....	46,849	52,935	346,082	433,674
Coke..... ...	45,586	46,168	304,183	282,705
Total	438,779	393,991	2,420,289	2,450,051

The total decrease was 29,762 tons, or 1.2 per cent., for the seven months.

The coal tonnage of the Pennsylvania Railroad for the week ending Aug. 7 was:

	Coal.	Coke.	Total.	1885.
Line of road.....	133,789	67,885	201,674	198,474
From other lines.....	74.795	586	75,381	75,647
Total.....	208,584	68,471	277.055	254,121
Year to Aug. 7.....	6,841.901	2,006,137	8,848,038	7,931,383

Increase for the week, 22,934 tons, or 9.0 per cent.; increase for the year, 916,655 tons, or 11.6 per cent.

RAILROAD LAW.

Right to Change Train Service in Massachusetts.

Application was recently made to the Massachusetts Railroad Commission by residents of Hyde Park, to require the New York & New England Co. to stop at that station two express trains which formerly stopped there, but which now run through without stopping. This application was based on the following section of the statute:

"A railroad corporation which has established and maintained throughout the year, for five consecutive years, a passenger station at a point upon its road, shall not abandon such station, nor substantially diminish the accommodations furnished by the stopping of trains thereat, as compared with that furnished at other stations on the same road."

The Commissioners, in refusing the application, state their interpretation of the law as follows: "The claim for the petitioners is founded on a rigid, and, as we think, a mistaken construction of the law. It is said that the Hyde Park stops are reduced by two; and that the stops at other stations are not reduced. Therefore, the accommodation is diminished, 'as compared with that furnished at other stations;' and, as these were favorite trains, the diminution is substantial. This is supposed to be almost a mathematical demonstration of violated law. We do not so understand the statute. It is not said that the amount of accommodation at one station shall not to be reduced without a corresponding reduction at all other stations. The main object of the act of 1865 (now sec. 156 of chap. 112) was to prevent the abandonment of stations to the unfair injury of persons who had made investments and arrangements in faith of their continuance. To prevent evasion of this prohibition, and to prevent the like evil of a great diminution of service, the clause as to substantial diminution was added. And to avoid too severe a restriction on the authority of managers, this was qualified by the reference to other stations. Without this last clause, a general reduction of passenger business could not be followed by a general reduction of passenger trains. The Board has no reason to believe that the Legislature intended by an iron rule to direct that every train which had been run for five years should be run for ever, even if by other trains necessarily placed on the road such running had become needless or dangerous, nor that every stop which had been made for that period should be made for ever, without regard to the needs or rights of travelers from other places. The words may be construed as forbidding such substantial diminution of accommodation at the station as will reduce it below that generally furnished at other stations. * *

"To operate a railroad by statute is difficult. It would become more difficult if an unbending rule required that a facility once furnished should always be continued, without regard to circumstances, or that, if withdrawn from one station, it should, therefore, be withdrawn from all."

OLD AND NEW ROADS.

Atchison, Topeka & Santa Fe.—On the extension of the Chanute Branch track is now laid to the Verdigris River, a distance of 17½ miles. This is one of the branches which are being built under the organization of the Chicago, Kansas & Western Co.

Baltimore & Ohio.—This company has begun suit against the stockholders of the Newark, Somerset & Straitsville Co. to recover $415,316 claimed due them on two promissory notes. The Newark, Somerset & Straitsville road has been leased to the Baltimore & Ohio Co. for a number of years, during which time large advances have been made by the lessee, and it is understood that the suit is the beginning of proceedings which will vest the absolute title to the road in the Baltimore & Ohio.

The Pennsylvania Railroad has notified this company that it will require hereafter the payment of regular local rates on all freight carried for it between Baltimore and New York. This action, it is understood, is taken in consequence of the approaching completion of the new line to New York. In consequence the Baltimore & Ohio has instructed its agents to take no more through business to or from New York by rail for the present and until further instructions. Arrangements have been made to carry freight between New York and Baltimore by water.

In consequence of this action the opening of the line between Baltimore and Philadelphia for freight traffic has been hurried up, and freight trains will be put on the road at once. Temporary freight stations have been provided in Philadelphia.

Boston & Albany.—The statements to the New York Commissioners give the following figures for the quarter ending June 30 and the nine months from Oct. 1 to June 30:

	Quarter.		Nine months.	
	1886.	1885.	1885-86.	1884-85.
Earnings..	$2,020,597	$1,833,665	$5,936,6 7	$5,522,672
Expenses.....	1,523,339	1,416,726	4,047,013	3,859,709
Net earnings..	$497.258	$416,939	$1,889,594	$1,662 963
Charges...	187,786	188,070	1,011,975	1,072,698
Surp'us..	$309,472	$228,869	$877,619	$590,265

The increase in the surplus for the nine months was $287,354, or 48.7 per cent. The road shows the effect of better rates on its through traffic in a very marked way.

Boston & Maine.—Officers of this company deny positively the reports that they wish to secure control of the Boston & Lowell or of any of its leased lines in New Hampshire. These reports, they say, are a revival of old rumors, long since proved to be untrue.

Boston, Revere Beach & Lynn.—This company, owing to its increasing business, has been obliged to purchase the entire control of the wharf property at East Boston which forms the terminus of its line. When the road was built, the Boston Land Co. donated one-half its property in that vicinity to the narrow gauge, and the demands of a rapidly growing traffic have made full control and ownership necessary.

Burlingame, Lyndon & Southern.—This company has filed articles of incorporation to build a railroad from Burlingame, Kan., to Lyndon and thence to some point on the Southern Kansas road in Coffee County. Surveys for the projected line have been begun.

Canadian Pacific.—This company's statement of earnings and expenses for June and the six months to June 30 is as follows:

	June.	Six months.
Gross earnings.....	$895,923	$4,160,343
Working expenses	519,473	2,866,728
Net profits....	$376,450	$1,293,615

"The gain in net profits over the same period last year is for June $92,959, and from Jan. 1 to June 30, $179,207. The gross earnings for June include nothing for the carriage of construction material, as against $70,549 during the same month last year."

Carolina Central.—On the extension of this road from Shelby, N. C., to Rutherfordton the bridge over the First Broad River has been completed. It is 300 ft. in length and 67 ft. above the water. Track is laid to Bushy Creek, 6 miles from Shelby, and there is another large iron bridge to be erected at this point. The grading is nearly all ready for the rails and the track will be laid as fast as the bridge work will permit.

Cedar Rapids & Chicago.—This company has filed articles of incorporation to build a railroad from Cedar Rapids, Ia., eastward to Manchester, a distance of 41 miles. Surveys are now in progress, and contracts, it is said, will be let as soon as possible.

Cherryvale, Paola & Kansas City.—This company has been organized to build a railroad from Cherryvale, Kan., northeast to Paola, on the Missouri Pacific road. The distance is 96 miles. The new company has already asked for town subscriptions along its projected line.

Chesapeake & Nashville.—This road is now graded from Gallatin, Tenn., northeast to Scottsville, Ky., a distance of 34 miles. Tracklaying was recently begun at Gallatin and the rails are reported down for 11 miles from the starting point. Contracts will soon be let for the grading of an additional 25 miles of road, from Scottsville to Glasgow.

Chicago, Madison & Northern.—The incorporation of this company, which was briefly noted last week, provides for the building of a railroad from Freeport, Ill., on the Illinois Central, northward to Madison. Two companies have been incorporated, one in Illinois and one in Wisconsin, to be consolidated hereafter. All the directors are

officers of the Illinois Central Co. The line will be about 55 miles long, and the company's agents are now securing the right of way. Grading has already begun at Freeport.

Chicago, Burlington & Northern.—The statement of tracklaying for the week ending July 31 is as follows:

	Week.	Total.
Main line	9 miles 620 ft.	348 miles 1,620 ft.
Permanent sidings	1 " 1,304 "	23 " 4,805 "
Temporary sidings	....	17 " 5,230 "
Total track	10 miles 1,924 ft.	390 miles 1,095 ft.

On July 31 there remained unfinished on the main line only 7 miles 60 ft., between East Dubuque and the Wisconsin River.

This gap was closed on Aug. 6, completing the work of tracklaying on the main line. The work of finishing up and preparing the track for regular trains is being rapidly pushed, but no date has yet been set for the opening of the road for traffic.

Chicago, Milwaukee & St. Paul.—This company has had surveys made for an extension of its Wisconsin Valley Division from Merrill, Wis., northward to the Gogebic iron range, and it is reported that work has already been begun with a considerable force.

Chicago, St. Louis & Peoria.—Work is shortly to be begun on this road, which is to extend from Springfield, Ill., to Peoria. The new line will be an extension of the St. Louis & Chicago road, now nearly completed, from Litchfield, Ill., north to Springfield.

Cleveland, Lorain & Wheeling.—This company recently began work on an extension of its tracks from Bridgeport, O., southward to Bellaire, the object being to connect with the Baltimore & Ohio at the last named place. Work has been stopped on the extension, however, on account of the opposition of the Cleveland & Pittsburgh Co., and probably nothing will be done until the Court has settled the question of the right of the new road to cross the Cleveland & Pittsburgh tracks.

Columbus & Eastern.—Grading has been for some time in progress for an extension of this road from its present terminus at Fultonham, O., to McConnellsville in Morgan County, a distance of 35 miles. Tracklaying has been begun.

Denver & Rio Grande Western.—Under order of the United States Circuit Court Mr. W. H. Bancroft, Receiver of this road, transferred the property to the Denver & Rio Grande Western Co. on July 29, and the receivership was then terminated. This action was taken in response to an application to the Court by the trustees, representing that the plan for funding interest and resuming payment had been accepted by nearly all the bondholders and that the earnings of the road had so much improved as to enable the company to resume payments of its obligations as they accrue. During the receivership the condition of the road has been very much improved, and under the agreement made with the Denver & Rio Grande bondholders the company has secured sufficient equipment to operate its road.

Fargo, Devil's Lake & Turtle Mountain.—This company has been organized at Fargo, Dak., to build a railroad from that city to the Devil's Lake country. The company has been promised considerable donation in land and money by the towns along the line.

Fremont, Elkhorn & Missouri Valley.—The new branch of this road from Fremont, Neb., to Lincoln, is now nearly all graded, and it is expected that tracklaying will be begun next week. The road will have to be completed by Nov. 1 next in order to secure the $50,000 in bonds voted by the city of Lincoln.

French Broad.—This company has filed articles of incorporation in Tennessee to build a railroad from Paint Rock, on the North Carolina line, through the valley of the French Broad River to Knoxville, a distance of about 75 miles. The incorporators and directors are all connected with the Richmond & Danville Co., and the new organization is intended to build the Knoxville Extension of the company's Western North Carolina line. Surveys are now in progress, and it is understood that work will be begun as soon as the location is completed.

Galveston, Sabine & St. Louis.—At the last annual meeting two boards of directors were chosen, one by the local stockholders and one in the interest of the construction company which is building the road. The litigation to determine the standing of the two boards was begun, but has now been closed by a compromise, the local board retiring but receiving representation in an entirely new board which has been elected.

Georgia Pacific.—Work is actively in progress on the gap between the Eastern and the Middle Division of this road. The line under construction extends from Coalburg, Ala., to Day's Gap, a distance of 39¼ miles. Grading is completed for about 10 miles from each end and tracklaying has been begun at each end, the intention being to lay track on the 20 miles of grade in order to facilitate the work on the remaining section of 19¼ miles. The object is to have the work done and the road in operation from Atlanta, Ga., to Columbus, Miss., early next spring.

The company is now having surveys made for the extension of the Greenville Division, the western end of the road, from its present terminus at Johnsonville, Miss., to a connection with the Illinois Central at Greenwood. As soon as this extension is finished the Western Division will be changed from 3 ft. to standard gauge. Nothing has yet been decided as to the extension of this division eastward to a connection with the middle division at Columbus.

In order to meet the demands of the road for additional equipment the Georgia Pacific Trust Co., organized with a capital stock of $600,000, of which there has been issued $360,000, the remainder being reserved for future need. Under this equipment trust there have been ordered for the road 15 Mogul freight engines 100 box, 10 stock and 415 coal cars, all for early delivery.

The management of the road is now entirely distinct from that of the Richmond & Danville, although the relations of the company with the Richmond & Danville remain close and friendly and the traffic contract is still in force.

Hornellsville & Lackawanna.—A contract for the construction of this road, which is to extend from Hornellsville, N. Y., to a connection with the Lackawanna & Pittsburgh road, has been let to Blake Brothers & Co., of New York, the work to be completed within 60 days after all the right of way is secured.

Louisville, New Orleans & Texas.—The statement for June and the six months to June 30 is as follows:

	June.		Six months.	
	1886.	1885.	1886	1885.
Earnings	$101,679	$67,147	$731,477	$533,229
Expenses	85,898	77,834	599,105	482,134
Net earnings	$15,781	*$10,687	$132,372	$51,095

*Deficit.

For the half-year the gross earnings increased $198,248, or 37.2 per cent., and the expenses $116,971, or 24.3 per cent., the result being a gain of $81,277, or 159.3 per cent., in net earnings.

Long Island.—The statement to the New York Commission for the quarter ending June 30 is as follows:

	1886.	1885.	Inc. or Dec.	P. c.
Earnings	$748.000	$717,948	I. $30.142	4.2
Expenses	475,589	449,199	I. 26.390	5.9
Net earnings	$272,501	$268.749	I. $3,752	1.4
Other income	23,696	17,916	I. 5,780	32.1
Total	$296,197	$286.665	I. $9,532	3.3
Charges	164,304	162,834	I. 1,470	0.9
Surplus	$131,893	$123,831	I. $8,062	6.5

The dividend paid for the quarter was 1 per cent., requiring $100,000, and leaving a balance of $31,893 as surplus.

Louisville Southern.—The Southern Contract Co., which has undertaken the construction of this new line, gives notice that it will receive propositions until Sept. 1 for the grading and masonry of the road from Louisville to a connection with the Cincinnati, New Orleans & Texas Pacific road, the distance being 84 miles. Proposals will be received for three different routes, the first by Shelbyville, Lawrenceburg and Nicholasville or Lexington; the second by Taylorsville, Lawrenceburg and Harrodsburg; the third by Taylorsville, Willisburg and Danville. Profiles and specifications can be seen at the office of Mr. John McLeod at the *Courier-Journal* Building in Louisville. Proposals will not be considered for any section less than 5 miles.

Mexican Railroad Notes.—The following notes are from the *Mexican Financier* of July 31:

The stockholders of the Toluca, Tenancingo & Cuernavaca Railroad Co. elected a board of directors at a recently held meeting at Toluca, Gov. Zubieta, of the State of Mexico, presiding at the meeting. It is announced, officially, that the company has the funds to push the work on to completion.

It is estimated that to build the section of the National road, now uncompleted on the main line, extending some 362 miles between Saltillo and San Miguel de Allende will cost $5,000,000 and to construct the branch from Lampasas to the Sabinas coalfields will require $1,000,000. The National, under its reformed concession, is empowered to build this line into the coalfields. It is estimated that $2,000,000 more could be usefully employed in completing other needed sections and thoroughly equipping them, making a total of only $8,000,000 to render the National system practically complete. The gap of 362 miles on the main line has been thoroughly surveyed, and it has been found that, for 300 miles, the country permits easy grades and cheap construction, the remaining 62 miles offering no greater difficulties than have been found on other parts of the line, always excepting the Toluca Division, which is exceptionally difficult. From Saltillo to San Luis Potosi, some 100 miles, the road will traverse a good grazing and mineral country. It will pass through the famous Catorce mineral district, where a vast amount of ore is to be had which will have to be hauled to the United States for smelting. At Saltillo the National will ascend to the cool, table-land region, on which it will continue right through to this capital. An interesting point of competition for both the Central and the National will be found at San Luis Potosi, where already the wagon trains of both companies meet.

Milwaukee, Lake Shore & Western.—This company makes the following statement for the half-year to June 30:

	1886.	1885.	Increase.	P. c.
Earnings	$942.768	$560.128	$382.640	68 3
Expenses	521 296	411,516	109,780	26.6
Net earnings	$421,472	$148.612	$272,860	183.6

The large increase in earnings is due to the opening of the road through to Lake Superior at Ashland, and the traffic from the new iron mines on the Gogebic Range.

Minnesota & Northwestern.—This company reports that the gross earnings (on 109 miles worked) for June were $43,715; the expenses were $19,359, and the net earnings $24,356. The interest on the outstanding bonds was $10,784, leaving a surplus of $13,572 for the month.

Mississippi & Leech Lake.—This company has been incorporated in Minnesota to build a railroad from St. Cloud, along the west side of the Mississippi, to Little Falls and thence to Leech Lake. The capital stock will be $3,000,000 and the company's office will be in Minneapolis.

New Orleans, Natchez & Fort Scott.—This company has been organized in Louisiana to build a railroad from Vidalia, opposite Natchez, Miss., northwest to the Arkansas line. It is intended to be part of a projected line from New Orleans to Fort Scott, Kan.

New Orleans & Northwestern.—This company has been organized in Mississippi under an old charter. The projected line is from New Orleans to Natchez, Miss., and is intended to form part of a line from New Orleans to Fort Scott, Kan.

New York, Lake Erie & Western.—The statement to the New York Railroad Commission for the quarter ending June 30 is as follows:

	1886.	1885.	Inc. or Dec.	P. c.
Earnings	$5,580,738	$4.402,558	I. $1,178,180	26 7
Expenses	3,839,293	3,404,634	I. 434,659	12.7
Net earnings	$1,741,445	$997 924	I. $743,521	74 3
Income other sources	348,920	294,602	I. 54,318	18.2
Total income	$2,090,365	$1,292,526	I. $797,839	61.4
Interest, rentals and taxes	1,878,053	1,937,305	D. 59,252	3.1
Surplus	$212,312	*$644,779	I. $857,091	.....

*Deficit.

As was to be expected from the monthly statements, this is the best showing that the company has made for a long time.

New York, New Haven & Hartford.—The reports to the New York Commissioner give the following figures for the quarter ending June 30 and the nine months from Oct. 1 to June 30:

	Quarter.		Nine months.	
	1886.	1885.	1885-86.	1884-85.
Earnings	$1,859,826	$1,064.362	$5,340.320	$4,845,074
Expenses	1,201.448	1,011,097	3,447,902	2,918,155
Net earnings	$658.378	$653,355	$1,892,328	$1,926,919
Other income	9,793	4,629	20,889	9.523
Total	$668 171	$657,984	$1,913,217	$1,936,442
Charges	204.947	204.947	614,841	614,841
Surplus	$463,224	$453,037	$1,298,376	$1,321,601

The decrease in surplus this year was $23,125, or 1.7 per cent. for the nine months. The surplus this year was equivalent to 8.38 per cent. on the stock, against 8.53 per cent. last year.

Ohio & Mississippi.—This company's statement for June and the six months to June 30 is as follows:

	June.		Six months.	
	1886.	1885.	1886.	1885.
Earnings	$308,119	$264,201	$1,730,719	$1,738,415
Expenses	224,657	192,306	1,306,761	1,353,700
Net earnings	$83,462	$71.895	$423.958	$384,715
Per cent. of exps.	72 9	72.8	75.5	77.9

For the half-year the gross earnings decreased $7,696, or 0.4 per cent., and the expenses $46,939, or 3.5 per cent., the result being a gain of $39,243, or 10.2 per cent., in net earnings.

Oregon Improvement Co.—The statement for June and the seven months of the fiscal year from Dec. 1 to June 30 is as follows:

	June.		Seven months.	
	1886.	1885.	1886.	1885.
Earnings	$271,781	$222,442	$1,450,614	$1,590,219
Expenses	185,661	177,050	1,199,069	1,301,206
Net earnings	$86,120	$45,392	$251,545	$289,013

For the seven months the gross earnings decreased $139,605, or 8.7 per cent., and the expenses $102,137, or 7.8 per cent., leaving a decrease of $37,468, or 12.9 per cent., in net earnings.

St. Louis Southern.—This company has filed articles of incorporation in Illinois. The line described indicates that a company is organized to operate the St. Louis Coal Railroad, which was recently sold under foreclosure.

Salina, Columbus & Southeastern.—The object of this new road is to carry coal from the extensive fields of Cherokee County, Kan., to the northwestern part of the state, where fuel is scarce. It will be about 250 miles long. The road is to be built shortly from Salina in Saline County, Kan., through Parsons to Columbus in Cherokee County. Grading is now in progress from Parsons toward Columbus.

Sioux City, Bismarck & Fort Benton.—This company has been incorporated to build a railroad from Sioux City, Ia., to Bismark, Dak., and thence to Fort Benton, Mont., a pretty extensive line with not much chance of passing from the paper state of existence.

Sonora.—The statement for May and the five months to May 31 is as follows, the figures given being in Mexican currency:

	May.		Five months.	
	1886.	1885.	1886	1885.
Earnings	$23.797	$22.354	$120,283	$127,128
Expenses	19,024	19,415	96,811	99,344
Net earnings	$4,773	$2,939	$23,472	$27,784

For the five months the gross earnings decreased $6,845, or 5.5 per cent., and the expenses $2,533, or 2.6 per cent., leaving a decrease in net earnings of $4,312, or 15.5 per cent. The road is owned by the Atchison, Topeka & Santa Fe.

Southern Pacific.—The San Francisco *Bulletin* says: "The recent filing by the Southern Pacific Railroad of a map showing a railroad route from San Miguel eastward over the mountains to Lerdo has given rise to the erroneous report that the company intends to build at once over this route, and will abandon the route nearer the coast which passes through San Luis Obispo, San Buenaventura and Santa Barbara counties. The map which has been filed is only for the purpose of securing under the United States laws the right of way through lands now belonging to the government, so that when the line is built, which may not be for many years, there will be no difficulty in this matter. Securing right of way through a country which has been settled is often very vexatious, as the needs of a railroad are sometimes taken advantage of to attempt extortion. The filing of the map has no connection with the line projected through the southern counties, which will be built as originally proposed. The Southern Pacific, under its charter, cannot build on the coast route further than San Miguel; but to enable the coast line to be constructed, a new company was formed a short time ago, called the Southern Pacific Branch Railroad. This company will continue the line of the Southern Pacific from San Miguel around by the coast, through San Luis Obispo, Ventura and Santa Barbara, to a connection with the Southern Pacific in the vicinity of Newhall. At some future time the road across the mountains to Lerdo will undoubtedly be built."

Southern Pacific Co.—The gross and net earnings of the roads in the Atlantic System for June were as follows:

	Gross earnings.		Net earnings.	
	1886.	1885.	1886.	1885.
Gal., Har. & S. A	$201,936	$225,587	*$2,909	$84,224
Gulf, W. T. & P	2,916	5,659	*2,612	4.118
Louisiana West	48,710	43,379	21,333	20,926
Morgan's La. & Tex	259,677	255,584	13,195	63,724
N. Y., Tex. & Mex	12.438	24,100	352	8,345
Texas & N. O	80,081	73,729	34,571	28,449
Total	$605,788	$628,038	$63,930	$209,786

* Deficit.

The decrease in the total gross earnings for the month was $22,250, or 3.6 per cent.; in the net earnings it was $145,856, or 69.5 per cent.

Texas & Pacific.—The Olcott-Fleming and the Wistar committees have agreed to give place to a new committee, composed of three of the Fleming and four of the Wistar committee. The new committee stands as follows: I. J. Wistar, Chairman; John Markoe, William D. Winsor, Robert Fleming, C. M. McGhee, Mayer Lehman, John M. Hutchinson and John Lowber Welch.

On Aug. 11 this committee made the following announcement to holders of Texas Pacific bonds:

"By mutual agreement made between committees of which F. P. Olcott and I. J. Wistar are Chairmen, and at their joint request, the undersigned have consented to act as a joint committee in their place, to continue the reorganization of the company upon a modified plan which has been agreed upon, and which, it is believed, will receive general approval. The modified plan will be immediately printed and deposited at the Farmers' Loan & Trust Co. in New York, and the Fidelity Trust Co. in Philadelphia, for distribution to all persons interested."

It is said that the compromise agreement will involve the control of the reorganized company by the Gould interest, which will not be acceptable to many of the bondholders.

Wabash, St. Louis & Pacific.—In accordance with the order of the Court, the Receivers report that the earnings of the Chicago Division for the two years from May 29, 1884, to May 31, 1886, were as follows:

Earnings	$2,973,231
Working expenses	2,466,012
Net earnings	507,219
Rentals, proportion of car trusts, etc	645.909
Deficit for the two years	$138.690

The earnings were ascertained as follows: The Chicago Division was credited with the entire earnings on local freight

traffic, namely, traffic passing from stations in this division to other stations on it. The report then devotes 50 paragraphs to showing how the other class of freight traffic was apportioned, it being principally on a mileage *pro rata*. As to local passenger traffic, the Chicago Division was credited with it all, but on all passenger traffic passing between any station on this division and any station on the main line and other branches of the Wabash, the earnings were divided on a mileage *pro rata*, bridge tolls being deducted before prorating in all cases where traffic crossed the Mississippi River.

During the receivership the expenses of the division have been ascertained in the following manner: The Chicago Division was charged with all advertising pertaining to business of that line and a proportion of all general advertising based upon earnings of all lines in the system except 12 minor roads. Also with a proportion of the salaries and expenses of soliciting and traveling agents on the same basis as general advertising. Also with the salaries of agents at all stations on this division except at stations common to two or more branches, when a proportion was charged. As to conductors, baggage-masters, brakemen and porters, the Chicago Division was charged with the full pay on trains running exclusively on the division, and a mileage proportion on through trains. As to cleaning, fuel, hire of passenger and freight cars, the charge was made on a proportion based on mileage and earnings. The Chicago Division was also charged with the salaries of all clerks engaged on the division, and a *pro rata* proportion of those in the general offices based on earnings.

As to commissions, this division was charged with commissions paid upon the same basis as that upon which the revenue for the tickets upon which the commissions was paid was apportioned. With regard to damage to property, stock, individuals, baggage, freight, etc., and mail expenses, this division was charged with all expenses incurred on the line and a proportion based on earnings where the expenses were common to the whole line. The division was charged with the salaries of superintendents of divisions, assistants, etc., the same rule being followed. The division was also charged with the expenses of union depots on that line, and also with dining-car expenses incurred on it. With regard to the motive power, repairs of engines, etc., supplies, fuel, a like proportion was observed. With regard to the maintenance of cars, repairs, etc., this division was charged with a proportion of the expenses of the entire system based upon the proportion which the number of miles run by cars on that division bore to the number of miles run by cars on the entire system. The division was charged for maintenance of way, incidentals, printing and stationery and salaries of engineers, the whole expenses incurred on the division, and also with a proportion of the general expenses which could not be located.

Waco & Bowden.—The incorporators named in the charter of this company, which was granted by the Legislature of Georgia at its last session, met recently, and after making a temporary organization, resolved to open books of subscription and to call a meeting of subscribers for permanent organization as soon as the subscriptions amount to $20,000. The projected line is from Waco, Ga., on the Georgia Pacific road, south to Bowden in Carroll county. It will be about 13 miles long.

Western, of Florida.—This name has been adopted by the company formerly known as the Green Cove Springs & Midland. The road is in operation from Green Cove Springs, Fla., to Sharon, 12¼ miles. Work has just been begun on an extension to Melrose, 22 miles.

West Shore.—Beginning Aug. 9, De Witt, near Syracuse, is to be made the dividing point between the eastern and western division of this road, the line from Coeymans Junction being thus divided into two instead of three divisions. The through freight trains from the same date will run around Syracuse on the New York Central freight track instead of using the West Shore line through the city.

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the current volume of the *Railroad Gazette:*

	Page.		Page.
Alabama Great Southern	423	Manchester & Lawrence	414
Ala., N. O., Tex. & Pac. Junc.	423	Marquette, Houghton & Ont.	414
Americus, Preston & Lump.	492	Mexican Central	486
Atchison, Top. & Santa Fe	492	Michigan Central	23, 343
Atlanta & West Point	554	Mil., Lake Shore & Western	191
Atlantic & N. Carolina	485	Minnesota & Northwestern	518
B. & O. Employes' Relief Ass'n.	345	Mississippi & Tennessee	120
Baltimore & Philadelphia	15	Missouri, Kansas & Texas	467
Boston & Lowell	15	Missouri Pacific	366
Boston & Maine	23	Mobile & Girard	492
Boston & Providence	15	Montpelier & Wells River	493
Buffalo, N. Y. & Philadelphia	16	Nashua & Lowell	414
Cairo, Vincennes & Chicago	536	Nashville, Chatta. & St. L.	534
Camden & Atlantic	518	Natchez, Jackson & Col.	104
Canadian Gov't Railroads	272	Naugatuck	26
Canadian Pacific	363	New Haven & Northampton	393
Carolina Central	366	New London Northern	120
Central Pacific	469	New Orleans & Northeast.	423
Charlotte, Col. & Augusta	155	N. Y. & New England	16
Chartiers	504	N. Y., N. Haven & Hartford	23
Chesapeake & Dela. Canal	414	N. Y., Ontario & Western	86
Chesapeake & Ohio	240	N. Y., Providence & Boston	25
Cheshire	104	N. Y. Railroad Commission	393
Chicago & Alton	156	N. Y., Susquehanna & Wes.	139, 554
Chi., Burlington & Quincy	292, 308	N. Y., West Shore & Buffalo	58
Chi. & Grand Trunk	324	Norfolk & Western	104, 525
Chi., Milwaukee & St. P.	208, 224	Northern Central	156
Chi. & Northwestern	414, 545	Norwich & Worcester	120
Chi., Rock Island & Pac.	503, 423	Northeastern (South Carolina)	16
Chi., St. P., Minn. & Omaha	423	Northern (New Hampshire)	414
Chi., St. L. & Pittsburgh	324	Ogdensburg & L. Champlain	554
Chi. & Western Indiana	485	Ohio & Mississippi	174
Cin., Hamilton & Dayton	485	Oregon & Transcontinental Co	553
Cin. & Muskingum Valley	394	Pacific Mail Steamship Co	518
Cin., N. Orleans & Tex. Pacific	140	Panama	307
Cin. & Springfield	208	Pennsylvania & New York	224
Cin., Wab. & Baltimore	518	Pennsylvania Railroad	175
Cleveland & Canton	192	Peoria, Decatur & Evansville	192
Cleve., Col., Cin. & Ind.	208	Philadelphia & Reading	48
Columbia & Greenville	174	Phila., Wil. & Baltimore	307
Col., Hocking Vy. & Tol.	192, 360	Pittsburgh, Cin. & St. L.	544
Concord	367	Pittsburgh & Lake Erie	68
Connecticut River	25	Pittsburgh Junction	95
Consolidation Coal Co.	139	Pitts., McK. & Youghiogheny	68
Cumberland Valley	507	Pitts., Wheeling & Ky.	394
Del. & Hudson Canal Co	256	Portland & Ogdensburg	120
Del., Lacka. & Western	104, 158	Providence & Worcester	120
Denver & Rio Grande	139, 536	Richmond & Alleghany	86
Des Moines & Fort Dodge	291	Richmond & Danville	85
Detroit, Lansing & No.	323	Richmond, Fred. & Potomac.	86
Detroit, Gd. Haven & Mil.	324, 518	Rochester & Pittsburgh	86
Dublin & Wrightsville	255	Rome, Wat. & Ogdensburg	85
Fitchburg	68	Rutland	493
Fort Wayne, Cin. & Louisv.	307	St. L., Iron Mt. & So.	267
Fremont, Elkhorn & Mo. Vy.	535	St. L. & San Francisco	192, 343, 360
Galveston, Houston & Hen.	367	St. L., Van. & Terre Haute	292
Georgia Pacific	272	St. Paul & Duluth	155
Grand Trunk	324	Savannah, Fla. & Western	344
Gulf, Colorado & Santa Fe	454	Sioux City & Pacific	525
Hanover June, Han. & Gett'g.	414	South Carolina	208, 308
Housatonic	192	Southern Pacific Co.	470
Houston & Texas Central	272	Sou. Ry. & Steamship Ass'n.	537
Huntingdon & Broad Top Mt.	120	Stewartstown	393
Illinois Central	174	Terre Haute & Indianapolis	470
Indianapolis & St. Louis	208	Terre Haute & Logansport	470
International & Gt. No.	367	Troy & Greenfield	223
Iron	493	Union Pacific	289
Kans. City, Ft. Scott & Gulf	486	Utica & Black River	272
Kans. City, Springfield & Mem.	485	Vicksburg, Shreveport & P.	423
Kansas City Union Depot Co.	256	Virginia Midland	139
Lake Shore & Mich. So.	23, 328, 344	Western Maryland	139
Lehigh Coal & Navigation Co.	140	Western North Carolina	192
Lehigh Valley	68, 224	Wilmington, Col. & Augusta	104
Leh. & Wilkes-Barre Coal Co	139	Wilmington & Weldon	104
Little Miami	394	Wisconsin Central	553
Louisville, N. Albany & Chi.	255	Worcester, Nashua & Rock.	191
Maine Central	68	Wrightsville & Tennille	256

Memphis & Charleston.

This company owns a line from Memphis, Tenn., to Stevenson, Ala., 272 miles, with 20 miles of branches. It leases the use of the Nashville, Chattanooga & St. Louis track from Stevenson to Chattanooga, Tenn., 38 miles, making 330 miles worked. The following brief statement has been published for the year ending June 30 last:

The earnings for the year were as follows:

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Earnings	$1,323,5:8	$1,384,905	D. $61,377	4.4
Expenses	937,214	1,057,284	D. 120,070	11.3
Net earnings	$386,314	$327,621	I. $58 693	18.0
Gross earn. per mile	4,011	4,194	D. 183	4.4
Net " "	1,171	990	I. 181	18.0
Per cent. of exps	70.8	76.7	D. 5.9	....

Estimated on the basis of 1884-85 the fixed charges were about $320,000. This would leave a surplus of $66,314 for the year, if the estimate be correct.

Northern Pacific.

The following is published as an approximate statement of the operations of this company for the fiscal year ending June 30:

	1885-86.	1884-85.	Inc. or Dec.	P. c.
Earnings	$11,730,527	$11,234,150	I. $496.377	4.5
Expenses	5,919,300	5,953,801	D. 34,501	0.6
Net earnings	$5,811,227	$5,280,349	I. $530.878	10 1
Other income	200,000	140,424	I. 59,576	42.5
Total	$6 011.227	$5,420,773	I. $590 454	10.9
Interest, rentals, etc	5,954,095	5,328,815	I. 625,280	11.7
Surplus	$57,132	$91,958	D. $34,826	37.8

The funded debt on June 30 (deducting general mortgage bonds bought for sinking fund) was $72,445,821, including $43,592,500 general mortgage, $18,857,000 general second mortgage, $5,351,500 Missouri Division and Pend d'Oreille Division and $4,640,821 dividend certificates. The interest charge is $4,346,749 yearly. On June 30 there was $38,058,311 preferred stock outstanding. The increase in charges last year was due chiefly to increased rentals.

Flint & Pere Marquette.

This company owns a line from Monroe, Mich., to Ludington, 253.34 miles, with 108.30 miles of branches; a total of 361.64 miles of road, with 181.48 miles of sidings and logging spurs. This makes a total of 543.12 miles of track, of which 373.88 miles are laid with steel rails. There was in 1884 an increase of 2.59 miles of sidings.

The equipment consists of 77 locomotives; 52 passenger, 6 parlor, 5 sleeping and 17 baggage, mail and express cars; 1,062 box, 8 stock, 200 coal, 866 flat and 38 caboose cars; 1 officers' car, 1 pay-car, 3 snow-plows and 16 service cars; 188 hand and push cars.

The general account is as follows, condensed:

Stock		$6,500.000
Funded debt		5,299,000
Accounts and balances		695,337
Profit and loss		18,592
Total		$12,512,929
Road and equipment	$11,256,191	
Stocks and other property	788,368	
Materials	154,982	
Accounts and balances	196,261	
Cash	117,128	
		12,512 929

The funded debt includes $1,000,000 Holly, Wayne & Monroe 8s; $300,000 Flint & Holly lease 10s; $75,000 Bay County 10s and $3,924,000 general mortgage 6s. There was no change during the year.

The earnings for the year were as follows:

	1885.	1884.	Inc. or Dec.	P.c.
Freight	$1,247,383	$1,457,160	D. $209,786	14.4
Passengers	636,750	735,067	D. 98,317	13.4
Mail and express	59,882	57,429	I 2.453	4 3
Miscellaneous	2,775	3,323	D. 548	16.6
Total	$1,946,790	$2,252,988	D $306,198	13.6
Expenses	1,347,839	1,515,461	D. 167,622	11.1
Net earnings	$598.951	$737.527	D. $138,576	18.8
Gross earn. per mile	5,383	6,239	D. 847	13.6
Net " " "	1,656	2 039	D. 383	18.8
Per cent. of exps	69.2	67.3	I. 1.9	....

The decrease in earnings, which began in 1884, continued throughout last year. Since the close of 1885, however, the gross earnings as reported monthly have shown a considerable gain.

The expenses for last year were divided as follows:

	Amount.	P. c.
Maintenance of way and buildings	$220,930	11.3
" " motive power and cars	222,589	11.4
Conducting transportation	728,245	37.4
General expenses	176,075	9.1
Total	$1,347,839	69 2

Taxes are included in expenses; they amounted last year to $42,333, or 2.2 per cent. of the gross earnings.

The result of the year was as follows:

Net earnings, as above		$598,951
Sundry accounts, profit and loss	$1,225	
Interest paid (less $28,870 received)	329,499	
Dividends (preferred stock), 4 per cent	260,000	
		593,724
Balance, surplus for the year		$5,227
Surplus from previous year		13,365
Total surplus, Dec. 31, 1885		$18,592

Expenditures for additions to property were: construction, $82,724; equipment (new cars), $8,094; total, $90,818.

The land report shows sales for 1884 of 6,409 acres for (including timber) 49,045. The average price per acre was $7.31. The amount collected in 1884 was $150,555, on account of principal, and $41,020 on account of interest. The land assets include land notes amounting to $334,745, and 101,009 acres of unsold lands.

The traffic for the year was as follows:

	1885.	1884.	Inc. or Dec.	P.c.
Pass. train-miles	771,708	738,321	I. 33,387	4.5
Freight " "	789,502	871,496	D. 81,294	9 4
Total locomotive miles	2,013,248	2,171,573	D. 158,325	7.3
Passengers carried	757,102	882,659	D. 125,557	14.2
Passenger-miles	23,380,115	27,231,295	D. 3,851.180	14 1
Tons freight carried	1,135,270	1,229,679	D. 94,409	7.7
Ton-miles	98,250.979	97,972,254	I. 278.725	0.3
Av. rate per ton-mile	1.269 cts.	1.388 cts.	D. 0.119 ct.	8.5
Av. train load:				
Passengers, No.	30.3	36.9	D. 6.6	17.8
Freight, tons	124.4	112.4	I. 12.0	10.7

The average rates per ton-mile last year were: Through, 0.488; local, 1.409 cents. Of the total tonnage lumber formed 31.45 per cent., logs 30.25, salt 9.70 and coal 4 per cent.

Locomotives ran 1.29 miles to each revenue train-mile. The earnings per train-mile were 120 cents; expenses, 81; net earnings, 39 cents.

There were 188,860 new ties used in renewals of track and 288,142 ft. timber in repairs and renewals of bridges. There were 170 ft. of bridge rebuilt and 78 ft. filled in. Two stone culverts were built and a long trestle partly filled. The grade was reduced at several points and other improvements of road made.

Shenandoah Valley.

This company owns a line from Hagerstown, Md., to Roanoke, Va., 238.11 miles, with 17.24 miles of short branches; a total of 255.35 miles. There are 24.40 miles of sidings.

Since April 1, 1885, the road has been in possession of Sidney F. Tyler, as Receiver in a suit brought by the trustee under the mortgages. The report, however, covers the operations of the road for the full year ending Dec. 31 last.

The equipment in use includes 41 locomotives; 18 passenger, 4 combination, 2 postal and 6 baggage cars; 275 box, 248 stock, 248 gondola, 25 flat and 8 caboose cars; 3 tool cars. There were also 428 transfer trucks, for which there is no longer any use, since the change of connecting lines to standard gauge.

Of the equipment above the company owns only 2 locomotives; 6 passenger and 4 express cars; 50 box, 25 gondola and 12 flat cars. The rest is held under car trust or rental agreements. The total amount of the principal of the car trusts at the close of last year was $661,306.

The company's balance sheet is as follows, condensed:

Capital stock		$3,695,200
Funded debt		8,883 000
Car trusts		749 666
Receiver's accounts		237,212
Accounts and balances payable		989.871
Total		$14,555,949
Road and property	$11,495,102	
Car trusts	749,666	
Securities owned	1,050.000	
Accounts and balances	23,848	
Income account, debit balance	1,237,333	
		14,555.949

The funded debt includes $2,270,000 first-mortgage 7s; $4,113,000 general mortgage 6s, and $2,500,000 income 6s. Of these bonds the company owns $119,000 general mortgage and $910,000 incomes, most of which are pledged as collateral for loans.

The earnings for the full year were as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Freight	$404,678	$459,442	D. $54,764	11.9
Passengers	198,506	197,802	I. 704	0.4
Other	91,708	85,127	I. 6,581	7.8
Total	$694,892	$742,371	D. $47.479	6.5
Expenses	663,162	613,015	I. 50.147	8 2
Net earnings	$31,730	$129.356	D. $97.626	75.7
Gross earn. per mile	2,721	2,920	D. 199	6.5
Net " "	124	509	D. 385	75.7
Per cent. of exps	95.4	82.6	I. 12.8	....

The earnings above given are for the full year. The division between the three months of operation by the company and the nine months by the Receiver is as follows:

	Earnings.	Expenses.	Net or deficit.
Company, 3 months	$141,360	$162,952	D. $21,592
Receiver, 9 "	553,532	500,210	N. 53,322
Total, year	$694,892	$663,162	N. $31, 30

The income account of the company is as follows, interest on bonds being charged up for the full year; car trusts and floating debt interest for three months only:

Deficit on operation, 3 months	$21,592
Interest on funded debt, full year	398.510
" " car trusts, 3 months	19 109
" and discount, 3 months	27.734
Total deficit for the year	$466.975
Back taxes, old accounts, etc	50,850
Deficit to Dec. 31, 1884	719.508
Income account, debit balance, Dec. 31, 1885	$1,237,333

The charges against the Receiver's net earnings ($53,322) for interest on car trusts and certificates were $42,288, leaving a net balance of $11,034. The Receiver's statement of receipts and disbursements, in a condensed form, is as follows:

Receipts from operation, etc		$749.507
" " Receiver's certificates		263,000
Total		$1,012,507
Current operating accounts	$654,134	
Interest on certificates	5,418	
Car-trust payments	65,999	
Debts of company	240,267	
		965.818
Balance on hand, Dec. 31, 1884		$46,689

The payments for the company were all for pay-rolls and other current accounts, except $2,678 for settlement of right of way claims.

The train and car mileage for the year was as follows:

	1885.	1884.	Inc or Dec	P.c.
Passenger train miles	305,909	372,083	I. 23,826	6 4
Freight " "	295,375	297,499	D. 2.124	0 7
Total locomotive miles	803,762	759,468	I. 44.294	5.8
Passenger car miles	1,674,404	1,479,056	I. 195,348	13.2
Freight " "	4,231,381	4,329,665	D. 98,284	2.3
Average train load:				
Passengers, No.	22.7	21.5	I. 1.2	5.6
Freight, tons	122.5	124 5	D. 2.0	1.6

Locomotive service last year cost 16.21 cents per mile run. Locomotives ran 1.16 miles to each revenue train mile. The average train was 4.2 passenger or 12.7 freight cars, the coal consumption being 12.2 lbs. per passenger car mile and 7.8 lbs. per freight car mile.

The traffic carried was as follows:

	1885.	1884.	Inc. or Dec	P.c.
Passengers carried	164,546	180,372	D. 15,826	9 0
Passenger-miles	9,001,674	7,998,718	I. 1,002,956	13.0
Tons freight carried	390,331	394,710	D. 4,379	1.1
Ton-miles	36,179,881	37,949,530	D. 1,769,649	4.7
Average rate:				
Per passenger-mile	2.205 cts.	3.297 cts.	D. 1.092 cts.	32.5
Per ton-mile	1.119 "	1.262 "	D. 0.143 "	11.3

The average passenger journey last year was 54.7 miles; the average freight haul was 92.7 miles. North-bound business furnished 61.6 per cent. of the ton-miles, and south-bound business 38.4 per cent. The average rate on local freight was 1.404 cents and on through freight 0.836 cent per ton-mile.

The decrease in gross earnings was largely due to continued depression of business and the light traffic in iron ore and other minerals from the line of the road. It was partly due also to low rates on traffic.

The expenses were heavy on account of the necessity of making extensive repairs to road and equipment immediately in order to operate the road properly.

There were used in renewals 1,012 tons of steel rails and 39,302 new ties. There was 0.58 mile of new sidings built. A large amount of work was done in repairing and renewing bridges, widening cuts and fills and ditching at various points. There still remain 55.46 miles of track laid with iron rails, most of them badly worn and needing immediate renewal.